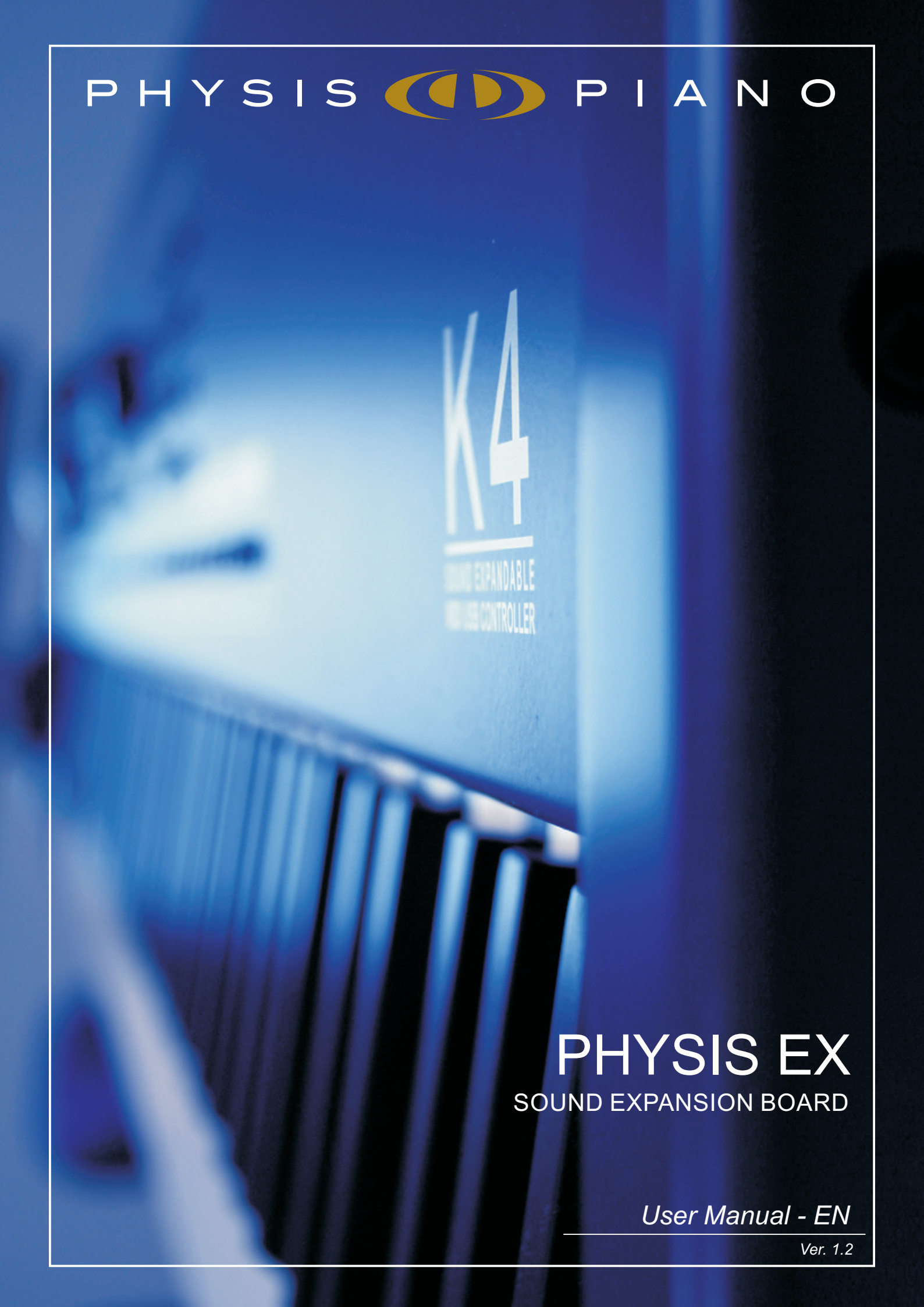
PHYSIS PIANO




# PHYSIS EX

## SOUND EXPANSION BOARD

*User Manual - EN*

*Ver. 1.2*

**Disposal of old Electrical & Electronic Equipment (Applìcable throughout the European Union and other European countries with separate collection programs)**

**Dir. 2002/95/CE, 2002/96/CE e 2003/108/CE**

This syrnbol, found on your product or on its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed overt to an applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences to the environment
and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resources. For more detailed information about the recycling of this product, please contact your local city offi ce, waste disposal service or the retail store where you purchased this product.

CE

This product complies with the requirements of EMCD 2004/108/EC and LVD 2006/95/EC.

## FCC RULES

**NOTE:** This equipment has been tested and found to comply with the limits for a **Class B** digital Device, persuant to Part 15 if the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio comunications. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determinated by turning the equipment off and on, the user is encuraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced Radio/Tv technician for help.

The user is cautioned that any changes or modification not expressly approved by the party responsable for compliance could void the user's authority opearate the equipment.

## INFORMATIONS FCC

**NOTE** : Cet instrument a été controlé et il est garanti pour etre en conformité avec les spécifications techniques établies pour les dispositifs numériques de la « **Classe B** » selon les normes de protection contre les interférences avec d'autres dispositifs électroniques environnants. Cet appareil produit et utilise des fréquences radio. S'il n'est pas installé et utilisé selon les instructions contenues dans le mode d'emploi, il peut générer des interférences. L'observation des normes FCC ne garanti pas qu'il y aura aucune interférence. Si cet appareil est la cause d' interférences avec une réception Radio ou TV, il est possible
de le vérifier en éteignant puis en allumant l'instrument : Vous pouvez alors résoudre le problème en suivant les procédures suivantes :

- déplacer ou orienter l'antenne de l'appareil avec lequel se manifeste l'interférence.
- déplacer cet instrument ou l'appareil avec lequel se produit l'interférence
- connecter cet instrument à une prise de courant différente afin de mettre les deux appareils sur deux circuits différents.
- consulter le revendeur ou un technicien radio/tv pour d'autres renseignements.

D'éventuelles modifications non approuvées par le constructeur peuvent annuler votre garantie de l'appareil.

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# 1. IMPORTANT NOTES

## 1.1 NOTES ABOUT THE MANUAL

- Take good care of this manual.
- This manual is an integral part of the instrument. The descriptions and illustrations in this publication are not binding.
- While the instrument's essential characteristics remain the same, the manufacturer reserves the right to make any modifications to parts, details or accessories considered appropriate to improve the product or for requirements of a constructional or commercial nature, at any time and without undertaking to update this publication immediately.
- All rights reserved; the reproduction of any part of this manual, in any form, without the manufacturer's specific written permission is forbidden.
- All the trademarks referred to in this manual are the property of the respective manufacturers.
- Read all the information carefully in order to obtain the best performances from your product and waste no time.
- The instructions provided in this manual only concern the instrument's operating system version that was up to date when the document was released. Therefore, such instructions might not describe faithfully your current operating system release. Please, visit the website *www.viscountinstruments.com* to check for the newest operating system release and manual.

# 2. GENERAL FEATURES OF PHYSIS EX

*Physis EX* is the expansion sound board for the K4 / K5 MIDI/USB Controller.

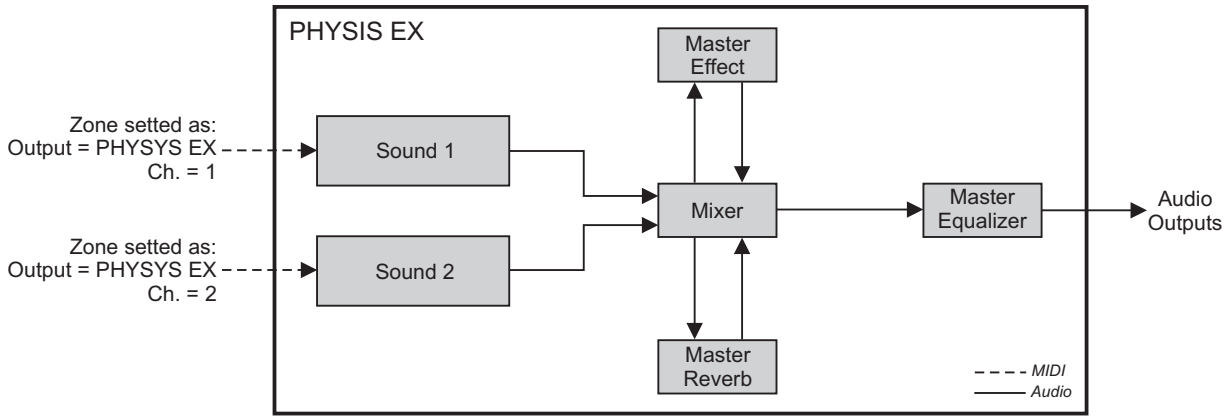
The core of *Physis EX* is a new technology, based on complex mathematical algorithms that faithfully simulate the mechanical and acoustic phenomena which generate the sound of real instruments. This is called a "physical model" and it is the heart of Physis technology.
This revolutionary sound technique does not require recording real instruments - a technique used by all others digital instruments today. Physis technology “calculates” in real time the waveform that each sound generates, through an accurate mathematical model. Such a model is based on a thorough and careful study of the way sound is produced in a given instrument. All parameters are taken into account by these physical models: for example, the materials of the instrument, the size and position of the components, of the instrument etc...
This means that Physis instruments do not simply “reproduce” a recorded sound, and can therefore reach a level of realism and detail that were unachievable before; the realism of real instruments.
The model replicates the original instrument, generating a different sound for each key, as in an acoustic piano. It is also able to produce a different sound at each subsequent pressure of the same key, keeping in mind the previous conditions.

*Physis EX* can replicate the following sounds through the physical modeling technique: upright and Grand piano (APM- Acoustic Piano Model); electric piano, in its versions from different periods (EPM- Electric Piano Model, WPM- Wurly Piano Model, CPM- Clavy Piano Model); idiophones (AMM - Acoustic Mallet Model).
The other sounds featured in the sound library are generated through the HDSE technology (High Definition Sound Engine). These sounds are: electronic piano, pipe organ, electromagnetic organs, synthesizer, string instruments, choirs, guitar, bass guitar and more.

The sound generated by a *Physis EX* can be modified and customized to the smallest detail.
Musicians can adjust their own Physis Piano according to their needs and taste. Size, resonance, mallets, strings: all these can be customised, affecting the harmonics produced by the strings, the reflection of the sound inside the case and many other sound features.
Many parameters of the electric piano can be customized, such as the transductors' position, tone bar size, hammer and damper size.
Xylophone, vibraphone and marimba can be customized by setting the bar material, the striking point, the mallet's material and much more.

# 3. PHYSIS EX INTERNAL STRUCTURE

The sound board *Physis EX* is composed of 6 main section, linked as in the following below:




The sound board can generate two sounds at the same time, one receiving data from MIDI channel 1, and the other from MIDI channel 2. In order to use the *Physis EX*, sounds, set the K4 / K5 EX Zones this way:

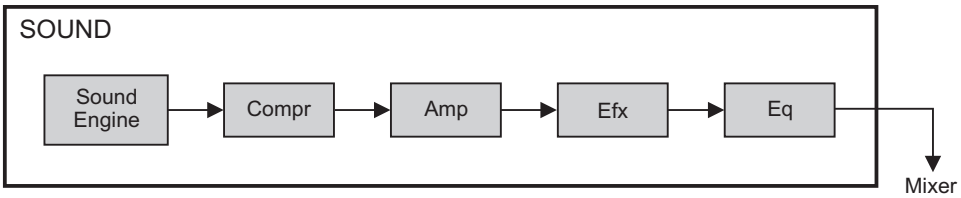
- Output = PHYSIS EX
- Ch = 1 to use Sound 1, 2 to use Sound 2

The sections perform the following functions:

- **Sound:** this is the sound generation section; the sound is selected through Bank Select and Program Change messages.
- **Mixer:** mixes the two sound signals and sends them to the next sections.
- **Master Effect:** this section adds a Chorus or Delay effect to the mixed sound.
- **Master Reverb:** this section adds a reverb effect to the mixed sounds.
- **Master Equalizer:** parametric or graphic 5-band equalizer; it adjusts the signal to fit the environment, and sends out the signal to the rear panel outputs.

*WARNING*
*APM (acoustic piano) Sounds cannot be assigned to Sound 2. The sound board ignores Bank Select messages attempting to do so, without causing any effect.*

The Sound section generates the sound and transmits it to the Master Effect, Master Reverb and Equalizer sections. The Sound section itself is composed of customizable sub-sections.




- **Sound Engine:** it is the first sound generation section, containing all the sound generation parameters that create and refine the sound. As described before, each Sound is generated by *Physis EX* through a dedicated synthesizing process; this means that each sound has a different set of parameters.
- **Compr (Compressor):** this section applies a compression effect to the signal coming from the SOUND ENGINE. The compressor can be customized by setting the "threshold". All signal below this threshold is compressed, and the signal beyond this threshold will be dampened: the final sound will be sharper and have a longer sustain effect. Other parameters that can be set are the amount of compression, the delay (i.e., when the effect starts affecting the signal), the end (i.e., when the effect stops affecting the sound) and the amplification.
- **Amp (Amplifier):** this section simulates an amplifier; it adjusts the signal level, and also modified the sound quality, simulating a wide range of transistor or valve amplifiers. It also simulates other customizable parameters: the different types of cabinet, the number of diffusors, frequency response, gain and distortion.
- **Efx (Effect):** this section applies further effects. Available effects are Delay (echo), Chorus, Flanger, Vibrato, Tremolo, Phaser, Tremolo+Phaser, Wah-Wah and Rotary. As with other sections, every single effect can be customized through different parameters, so as to fine tune the sound according to taste.
- **Eq (Equalizer):** this section applies a parametric equalizer to the signal. The equalizer is fully customizable, in order to fine tune the output signal even more in detail. High and low frequencies can be equalized; cutoff frequency, bandwidth, gain and medium-frequency abatement can be adjusted.

# 4. SOUND GENERATION PARAMETERS

## 4.1 SOUND ENGINE SECTION

### SOUND φPIANO

Acoustic piano Sounds

*WARNING*
*APM (acoustic piano) Sounds cannot be assigned to Sound 2. The sound board ignores Bank Select messages attempting to do so, without causing any effect.*

- HAMMER HARDNESS
  Range: -50...0...+50
  NRPN MSB=00, NRPN LSB=00
  Data Entry MSB Range: 14...64...114
  Allows you to change the brightness of the tone.
  In the acoustic piano hammers consist of a wooden profile covered with several layers of compressed wool felt, whose hardness is carefully controlled. In order to produce a good tone, the hardness has a gradient so the outer surface is softer than the inner layers. This gradient may be adjusted using various techniques in a process called 'voicing'. It is common to voice a piano by needling the hammer felt, since this makes the hammers softer and thus the tone softer.
  Hard hammers are better at exciting high frequency modes of a piano string's vibration so that the resulting tone quality may be characterized as being bright, tinny, or harsh. Soft hammers, on the other hand, do not excite high frequencies very well, and the resulting tone is somewhat dull or dark.

- HAMMER MASS
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=1
  Data Entry MSB Range: 14...64...114
  Affects the sound loudness and timbre.
  The hammer mass is proportionally related to the energy transmitted to the string during the impact consequent to the key action influencing the sound loudness and timbre. Heavier hammers are in contact with the string for a longer time generating multiple reflections on the string vibration that makes a fuller sound. By decreasing the hammer mass the sound becomes more "thin" and less intense. The effect produced by the hammer mass interacts with the hit point, moreover the final result can vary along the keyboard according to the ratio between the mass of each hammer and the mass of the corresponding string.

- HAMMER KNOCK
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=2
  Data Entry MSB Range: 14...64...114
  Allows you to adjust the impulsive knock sound
  When a piano key is pressed two impacts happens: the hammer hits the string and the key hits the piano base board. Both these impacts mechanically transmit energy to the soundboard and the complete piano body by generating an impulsive sound named knock sound. By damping the coupling between the piano parts, especially between the key and base board, it is possible to change the amount of the knock sound.

- HAMMER HIT POINT
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=3
  Data Entry MSB Range: 14...64...114
  Allows you to alter the character of the piano sound
  In the acoustic piano it is quite impossible to change the hit point since this is fixed by the piano manufacturer, while this is possible in the physis piano modelling, allowing new unexplored sound possibilities. Changing this parameter corresponds to virtually moving the string position in respect to the hammer position as shown in the animation. A 0 value corresponds to the standard distribution of the hit points along the 88 piano strings; positive values correspond to moving the hit point towards the bridge, while negative values correspond to moving the hit point in the opposite direction, i.e. towards the agraffe. The hit point affects the spectrum shaping of the produced sound by cancelling or reducing some specific partials mathematically related to the ratio between the hit point and the string length.

- TUNING UNISON
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=4
  Data Entry MSB Range: 14...64...114
  Allows you to vary the relative tuning of the members of a doublet or triplet in order to change their tuning from "unison" to "detuned".
  Each piano note corresponds to one, two, or three strings. Tuners typically tune the string couple or triplet not exactly to the same frequency, in this way they get the well know beating phenomena that the player perceives as timbre fluctuation during sound evolution. If such detuning is exaggerated the sound is perceived as completely out of tune, i.e. a Honky Tonk piano sound.
  A 0 value corresponds to the standard tuning with a small beat amount, while +50 corresponds to the maximum detuning and -50 corresponds to the perfect unison tuning.

- TUNING STRETCH
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=5
  Data Entry MSB Range: 14...64...114
  Allows you to adjust the deviation from the ideal piano tuning.
  Because the overtones of the piano string are not in a perfect harmonic relationship, the piano is not tuned according to the equal temperament, but according to a particular frequency distribution (known as Railsback distribution) for which low notes are undertuned and high notes are overtuned. The Stretch Tuning parameter allows you to modify such distribution.
  A 0 value corresponds to the standard Railsback tuning, while +50 corresponds to the enhanced Railsback tuning and -50 corresponds to the equal temperament tuning. The effect can be noticed by listening to the beats that are created between the partials of two notes an octave apart.

- FINE TUNING
  Range: -50...0...+50
  NRPN MSB=5, NRPN LSB Range=21...108 (A0...C8)
  Data Entry MSB Range: 14...64...114
  Allows you to tune each note. The effect of this parameter is relative because it is added to the *Stretch Tuning* parameter and master tuning setting.

- STRING STIFFNESS
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=6
  Data Entry MSB Range: 14...64...114
  Allows you to control the string flexibility which affects the regularity of harmonic distribution of the overtones.
  Piano strings are generally stiffer than those used in other stringed instruments such as the guitar. A stiff string is no longer perfectly flexible and gets some of the characteristics of a metal bar. The overtones frequencies of a flexible string have integer ratios (harmonics) to the fundamental. This relationship does not hold for the overtones of a stiff string, where the frequency distance of neighbouring overtones increases as a function of frequency, adding a bell-like character to the sound.

- STRING DUPLEX VIBRATION
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=7
  Data Entry MSB Range: 14...64...114
  Allows you to control the amount of sound produced by duplex strings.
  In several modern pianos the short portion of the string that is located between the Bridge and the Hitch pin is tuned in order to resonate sympathetically with a harmonic relationship to the corresponding notes. These additional short strings add brilliance to the treble notes of the piano.

- STRING LONGITUDINAL VIBRATION
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=8
  Data Entry MSB Range: 14...64...114
  Allows you to control particular sound components called "phantom partials".
  The main mode of a piano string vibration occurs along an axis perpendicular to the string itself (transverse motion). At the same time, the string can vibrate along its axis (longitudinal motion). The hammer excites the string mainly along its transverse axis, but, for large amplitudes, some energy is transferred from the transverse to the longitudinal motion. This type of vibration produces special components (phantom partials) that give a metallic character to the sound.
  The Longitudinal Vibration effect can be better heard by playing fortissimo on lower notes up to the 3rd octave.

- STRING RESONANCE

  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=9
  Data Entry MSB Range: 14...64...114
  Allows you to control the amount of resonance of strings at their fundamental or overtone frequencies when other strings are sounded.
  When one or more notes are played on a piano, the vibration is transmitted to all piano parts including the strings that are not played. Such vibration causes such passive and un-damped strings to slightly vibrate because of a physical phenomena known as sympathetic resonance. This natural effect replicates exactly what happens inside an acoustic piano giving beauty and realism to the generated sound.
  To evaluate the parameter's effects, play a chord on the lower octaves, pianissimo, and while keeping the chord pressed, play some of the highest notes. The highest the parameter value, the stronger is the resonance of the lower strings when palying high-pitched notes..

- DAMPER NOISE

  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=10
  Data Entry MSB Range: 14...64...114
  Adjusts the mechanical noise produced by the motion of the damper.
  In the acoustic piano the sustain pedal (or, damper pedal) lifts the dampers from all keys, sustaining all played notes. Whenever this pedal is pressed or released a typical noise is emitted by the plucking-like effect of the damper felt on the strings. Moreover such noise is further reverberated because of the resonant characteristic of the piano construction.

- DAMPER RESONANCE

  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB Range =11
  Data Entry MSB Range: 14...64...114
  Allows you to control the amount of resonance of all piano strings at their fundamental or overtone frequencies when the sustain pedal is pressed and some strings are sounded.
  When one or more notes are played on a piano the vibration is transmitted to all piano parts including the strings corresponding to keys that are not played. When the sustain pedal is pressed all dampers are lifted, therefore all piano strings are able to respond to the energy emitted from played notes, as a result they start to slightly vibrate because of a physical phenomena known as sympathetic resonance. This natural effect replicates exactly what happens inside an acoustic piano giving beauty and truthfulness to the generated sound.
  To better appreciate the DAMPER RESONANCE effect, play a chord at fortissimo on the highest octave, then repeat the chord with sustain pedal pressed. In this last case in addition to the played notes you will hear a background sound like a reverb. This is the DAMPER RESONANCE effect produced from the sound generated by all the piano strings excited from your chord.

- DAMPER SIZE

  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=12
  Data Entry MSB Range: 14...64...114
  Allows you to control the damper dimension that influences the release time of the piano notes.
  Each of the first 67 notes (from A0 up to F#6) is equipped by a damper that has the purpose to stop the sound when a key is released. The damper is made by a felt that, when it is in contact with the string, absorbs the vibrating energy causing the end of the sound. The damper size affects the release time of the sound: large dampers absorb more energy causing shorter release time; small dampers absorb less energy causing longer release time; In the following animation you can see how the damper size change.
  The effect of the DAMPER SIZE parameter is more pronounced on the bass section were the release time is longer.

- STRING LENGHT

  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB RANGE=13
  Data Entry MSB Range: 14...64...114
  Allows you to change the decay time of the sound.
  On a typical concert grand piano the length of the 88 strings vary from about 2m to 5cm. The STRING LENGTH is related to various sound parameters. One of the perceived effects is the duration of the sound, since the longer the string, the longer the decay time. The STRING LENGTH parameter allows you to change the sound duration of all strings.

- STRING ABSORPTION

  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=14
  Data Entry MSB Range: 14...64...114
  Allows you to change the period of the brightness of the sound.

Each note generated from a piano string is composed of overtones called 'partials'. The combination and duration of these partials lets you recognize the different sounds. Higher partials are decaying faster than the others. Because of this phenomena the piano note starts bright, but ends less bright. The absorption parameter allows you to control the amount of this phenomena.
The effect of STRING ABSORPTION parameter is more prominent for the middle and bass notes.

- SOUNDBOARD
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=15
  Data Entry MSB Range: 14...64...114
  Allows you to control "the general character" of a piano, since it greatly influences the quality of timbre, the sound energy diffusion and radiation.
  The sound generated by the strings is transmitted to the soundboard trough the bridge. In this way the sound is amplified and emitted, in a very complex spatial arrangement, from the vibrating surface of the Soundboard. Each soundboard is characterized by a typical distribution of resonances. When these are modified by the SOUNDBOARD parameter the sound colour and radiation are influenced.

## SOUND φWURLY, φPIANY

Electric piano Sounds that simulates the classic Wurlitzer© and Pianet©.

- HAMMER
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=0
  Data Entry MSB Range: 14...64...114
  Modifies the characteristic and size of the hammer that, during the impact with the reed, determines the sound loudness and timbre.
  When a key is pressed on the piano keyboard, the corresponding hammer strikes the small vibrating reed and then rebounds, allowing the reed to vibrate at its resonant frequency. The greater the key velocity, the greater the energy transferred from the hammer to the reed, and the louder the note produced. The hammer contact time with the reed is very short, but during this time the hammer greatly influences the sound timbre and loudness, not only at the attack, but for the entire sound evolution.

- DAMPER FELT
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=1
  Data Entry MSB Range: 14...64...114
  Changes the felt size that modifies the sound release time.
  Each time you release a key the corresponding damper felt enters in contact with the vibrating reed and dampens the sound vibration. The bigger the damper felt, the greater the absorbed energy and the shorter the sound release time.
  The effect of the DAMPER FELT parameter is more noticeable on bass notes.

- REED SIZE
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=2
  Data Entry MSB Range: 14...64...114
  Allows you to change the sound decay time.
  When a key is pressed, the hammer hits the reed bar, which then starts to vibrate. The larger the reed, the greater the stored energy and the longer the sound decay time.
  The effect of the REED SIZE parameter is more noticeable on bass notes.

- REED POSITION
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=2
  Data Entry MSB Range: 14...64...114
  Allows you to change the harmonic content of the sound.
  The Wurly and Piany Electric Pianos utilize as a tone generator a free reed actuated by a piano hammer and damped by a damper with an action similar to a standard piano. The tone pickups are mounted so the reeds vibrate through an opening made on a metal frame that surrounds the reeds. When the reed motion doesn't exceed the range of the pickup, the output waveform is a good replica of the reed motion. On the other hand, with loud tones, when the reed swings outside the pickup range, the output waveform is 'distorted' with a consequent increase of harmonic content. Thus the beginning of the notes have more harmonic content than the end, and loud notes have more harmonics than soft ones. The REED POSITION allows you to move the reed position with respect to the pickup position determining a change in the sound harmonic content.
  The effect of the REED POSITION parameter can be better heard on bass notes.

## SOUND φRHODY

Electric piano Sounds that simulates the famous Fender Rhodes©.

- HAMMER
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=0
  Data Entry MSB Range: 14...64...114
  Modifies the characteristic and size of the hammer that, during the impact with the tine, determines the sound loudness and timbre.
  When a key is pressed on the piano keyboard, the corresponding hammer strikes the thin cylindrical bar called "tine" and then rebounds, allowing the tine to vibrate at its resonant frequency. The greater the key velocity, the greater is the energy transferred from the hammer to the tine, and the louder the note produced. The hammer contact time with the tine is very short, but during this time the hammer greatly influences the timbre and loudness, not only at the attack but for all the sound evolution.

- DAMPER FELT
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=1
  Data Entry MSB Range: 14...64...114
  Allows you to change the sound release time.
  When a key is released the corresponding damper felt enters in contact with the vibrating tine and this damps the sound vibration. The larger the damper felt the greater the absorbed energy and the shorter the sound release time.
  The effect of the DAMPER FELT parameter is more audible on bass notes.

- TONE BAR SIZE
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=2
  Data Entry MSB Range: 14...64...114
  Allows you to change the decay time of the sound.
  When a key is pressed, a hammer hits the thin cylindrical bar called a 'Tine', which then vibrates like a reed. The Tine is connected to another resonator with reed-like structure called Tone Bar which is free to resonate at a frequency very near that of the tine. Vibrations can pass from the Tine bar to the Tone Bar that serves only to store vibrational energy. The larger the Tone Bar, the greater the stored energy and the longer the sound decay time.
  The effect of the TONE BAR SIZE parameter is more audible on bass notes.

- TONE BAR BODY
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=3
  Data Entry MSB Range: 14...64...114
  Allows you to change the initial bell-like characteristic of the sound.
  When a key is pressed, a hammer hits the thin cylindrical bar called a 'Tine', which then vibrates like a reed. The Tine transfers parts of his energy to the Tone Bar allowing the whole tone generator assembly to vibrate simultaneously in many modes, or patterns. The high frequency modes die out more rapidly than the low frequency. The tone generator assembly is shaped and mounted in such a way that these higher-frequency modes result in a nice bell-like attack that decays much more rapidly than the 'sustain' portion of the sound. By changing the TONE BAR BODY you can modify the resonance of the tone generator assembly with the consequence to changing the bell-like characteristic of the sound.
  When the TONE BAR BODY parameter has a value of -50 the sound is dull, while with the value is +50 the sound is brilliant with pronounced bell-like characteristic.

- TINE POSITION
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=4
  Data Entry MSB Range: 14...64...114
  Allows you to change the sound harmonic content.
  When a key is pressed, a hammer hits a thin cylindrical bar called a 'tine', which then vibrates like a reed. Such vibration is captured by the pickup in front of the tine. When the tine motion doesn't exceed the range of the pickup, the output waveform is a good replica of the tone bar's motion. On the other hand, with loud tones, when the tine swings outside the pickup range, the output waveform is 'distorted' with a consequent increase of the harmonic content. Thus the beginning of the notes has more harmonic content than the end, and loud notes have more overtones than soft ones. The TINE POSITION allows you to move the tine position with respect to the pickup position determining a change in the harmonic content.
  The effect of the TINE POSITION parameter can be better heard on bass notes.

## SOUND φ CLAVY

Electric piano Sounds like Clavinet D6© and E7©.

- PANEL

  Range: On/Off for 4 switches
  NRPN MSB=0, NRPN LSB=4
  Data Entry MSB Range: 00...15
  Allows you to set the switches of the side control panel and so the sound characteristics.
  The first four switches allow you to apply different filters useful to "colour" the sound, like this:
  - Brilliant: very brilliant hi-pass filter.
  - Treble: band-pass filter regulated on the high frequencies.
  - Medium: band-pass filter regulated on the mid frequencies.
  - Soft: low-pass filter to obtain o very loud sound.

  Range: On/Off for 4 switches
  NRPN MSB=0, NRPN LSB=5
  Data Entry MSB Range: 00...2
  Last two switches control the combination of the two available pickups in this way:
  - C+A: "Lower" pickup, warm sound.
  - B+C: "Upper" pickup, bright incisive sound.
  - B+D: both pickups, very full sound.
  - A+D: both pickups on, out of phase; the fundamental cancels somewhat and you're left with a pretty sharp sound.

- SLIDING MUTE LEVEL

  Range: 0...50
  NRPN MSB=0, NRPN LSB=6
  Data Entry MSB Range: 0...50
  Sets the position of the sliding damper, in order to control the sound decay time.

- TANGENT

  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=0
  Data Entry MSB Range: 14...64...114
  Determines the sound loudness and timbre.
  Underneath each key of the piano keyboard there is a rubber tip, called a tangent. When a key is pressed, the tangent strikes the corresponding and traps it against a metal stud for the duration of the note, splitting the string into a speaking and a nonspeaking part. Moving the slider to the left you can change the characteristic and size of the *Tangent* and thus its influence on sound loudness and timbre.
  With negative values you can get a duller sound, while positive values give you brighter sounds.

- DAMPING YARN

  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=1
  Data Entry MSB Range: 14...64...114
  Allows you to change the sound release time.
  When a key is pressed, the tangent strikes the corresponding string and traps it against a metal stud for the duration of the note, splitting the string into a speaking and a nonspeaking part. The nonspeaking part is bent by a damping yarn that stops its oscillation. When the key is released the string parts unite allowing the oscillating part of the string to be damped by the yarn. By changing the DAMPING YARN parameter you can change the amount of yarn and thus the sound release time.
  The effect of the DAMPING YARN parameter can be better heard on bass notes. Positives values correspond to the increase of the yarn and thus decrease the release time, while negatives values correspond to the decrease of the yarn and thus increase the release time.

- PICKUP POSITION

  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=2
  Data Entry MSB Range: 14...64...114
  Allows you to change the character of the sound.
  Guitarists well know the pickup position affects the guitar timbre. With the PICKUP POSITION parameter you can get a similar effect by moving the pickup location in respect to the Clavy strings. When the pickup is close to the bridge (string end) the timbre is sharper, and when it's moved towards the string centre the timbre becomes softer.

- AGE

  Range: 0...50
  NRPN MSB=0, NRPN LSB=3
  Data Entry MSB Range: 0...50
  Allows you to change the character of the Clavy sound.
  When some parts of the Clavy age, like the tangent rubber or damping yarn, they change their characteristic influencing the attack time, release time and impact noise.

## SOUND φ MALLET

Xylophone, vibraphone and marimba Sounds

- BAR MATERIAL
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=0
  Data Entry MSB Range: 14...64...114
  Allows you to change the character of the sound and release time.
  The bar dimensions are related with the frequency of the produced note, while the tone character and length depends on the bar material. The more rigid and homogeneous (metal) the bar material, the sharper the resonances and the slower is the sound decay.
  The more elastic and anisotropic (wood), the bar material, the weaker the resonances and the faster the sound decay.
  Positives values of the BAR MATERIAL parameter correspond with a more rigid material, while negative values correspond to a more elastic material.

- MALLET MATERIAL
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=1
  Data Entry MSB Range: 14...64...114
  Determines the sound loudness and brigthness.
  When the mallet hits the bar it transfers energy that allows the bar to vibrate. The mallet material influences the nature of the impact and consequently the tone of the produced sound. The more the mallet material is rigid and homogeneous, the faster the sound attack and more "thin" the initial sound.
  The softer the material, the fuller low tones of the initial sound.
  Positives values of the MALLET MATERIAL parameter correspond to a more rigid material, while negative values correspond to a softer material.

- HIT POSITION
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=2
  Data Entry MSB Range: 14...64...114
  allows you to change the point where the mallet hits the bar changing the timbre of the sound .
  Each time the mallet hits the bar, the bar starts to oscillate at its resonant frequency with a timbre that depends on the hit position. The hit position influences the relative amplitudes of the various overtones of the sound.

- HIT RANGE
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=3
  Data Entry MSB Range: 14...64...114
  Allows you to change the width of the area where the mallet hits the bar.
  When a musician plays a mallet instrument, he/she intentionally hits the bar in a specific point in order to get the desired timbre (see HIT POSITION Parameter). However, because of human imprecision the effective hit point can randomly change around the desired hit point. The MALLET HIT RANGE parameter allows you to set the size of the area within the effective hit point can randomly take place. This unique feature allows you to get a more realistic performance even by using the piano keyboard.
  The effect can be easily heard when the the mallet hit range is large (positive values) and the same note is repeatedly played. The greater the range, the greater the variance of the notes timbre.

- ROTOR ANGLE
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=4
  Data Entry MSB Range: 14...64...114
  Beneath each bar there is a tube with a butterfly valve, moved by an electric rotor. When the rotor is off (see Rotor On/Off parameter), the parameter allows to rotate the valve and modify the sound character.

- ROTOR SPEED
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=5
  Data Entry MSB Range: 14...64...114
  This parameter controls the rotation speed of the butterfly valve (when the rotor is on). The rotation generates a tremolo effect.

- ROTOR ON/OFF
  Range: -50...0...+50
  NRPN MSB=0, NRPN LSB=6
  Data Entry MSB Range: 14...64...114
  Set the rotor on or off. The rotor rotates the butterfly valve.

## SOUND KEYBOARD
This group contains the following sounds: electronic piano, pipe organ and electromagnetic organ.

## SOUND ENSEMBLE
This group contains the following sounds: synthesizer, string instruments, choirs.

## SOUND BASS&GUITAR
Bass and guitar sounds.

Each Sound ha four parameters that can be controlled through MIDI messages:

- Parameter 1
  Range: 0...127
  NRPN MSB=0, NRPN LSB=0
  Data Entry MSB Range: 0...127

- Parameter 2
  Range: 0...127
  NRPN MSB=0, NRPN LSB=1
  Data Entry MSB Range: 0...127

- Parameter 3
  Range: 0...127
  NRPN MSB=0, NRPN LSB=2
  Data Entry MSB Range: 0...127

- Parameter 4
  Range: 0...127
  NRPN MSB=0, NRPN LSB=3
  Data Entry MSB Range: 0...127

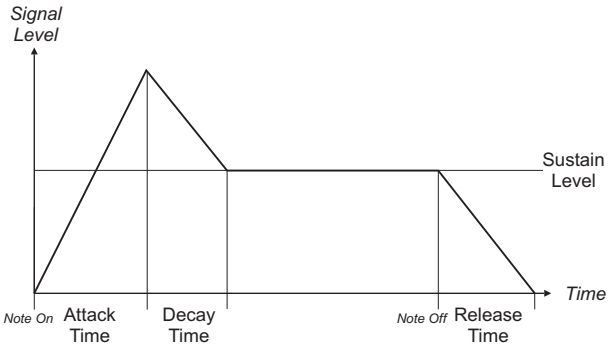
For information on the selected Sounds, see the table at chapter 6.
Available parameters are:

- ATTACK DETUNING: tuning variation in the attack phase, that is, right after a key has been pressed. The higher the value, the stronger is the tuning variation.

- ATTACK TIME: the attack time is the amount of time the sound needs to reach the maximum signal level, after a key has been pressed. The higher the value, the longer the attack time.

- BALANCE: volume balance among differently sized pipes.The higher the value, the greater the number of large pipes.

- BELL LEVEL: the high-pitched component during the attack time, that confers a bell-like feature to the sound. The higher the value, the brighter the attack.

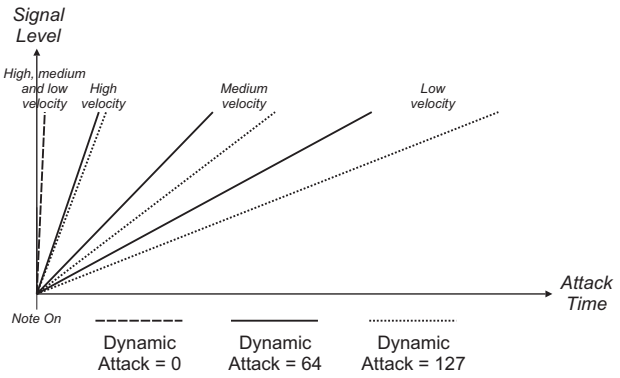


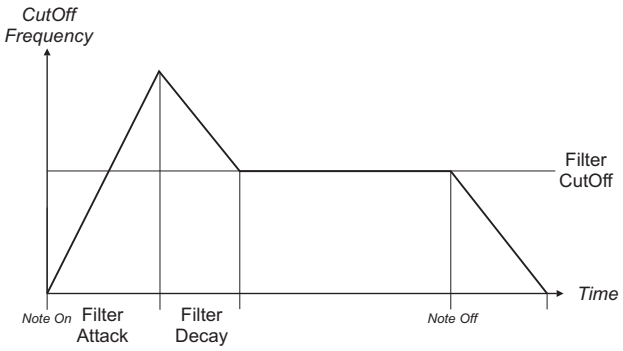

- CLICK LEVEL: level of the click generated whenever pressing and releasing a key in electromagnetic organs. The higher the value, the stronger the click.

- DECAY TIME: duration of the Decay phase that is, the time a sound takes to reach the stationary level (Sustain phase) after its apex (attack), after pressing a key. The higher the value, the longer the decay time.

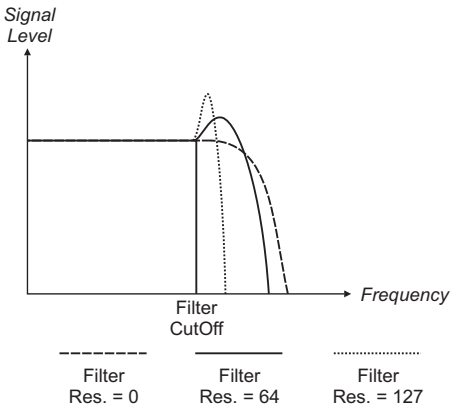
- DETUNE: in string instruments, it is the difference in tuning between the different strings linked to the same key. In pipe organ, this parameter is the difference in tuning between the pipes linked to the same key. The higher the value, the stronger the detuning.

- DYNAMIC ATTACK: generates a longer attack time while playing with low key velocity. The higher the value, the slower the attack.






- FILTER ATTACK: filter attack time; that is the time it takes to reach the maximum cutoff frequency. The higher the value, the longer the attack time.
- FILTER DECAY: the time a filter takes to move from the maximum cutoff frequency to the level set by the Filter Cutoff parameter. The higher the value, the longer the decay time.
- FILTER CUTOFF: Filter's Cutoff frequency, which regulates the sound's brightness. The higher the value, the higher the frequency.




- FILTER RESONANCE: filter's resonance curve, which determines an increased level of the frequencies close to the cutoff frequency. The higher the value, the louder are these frequencies.
- HIVELOCITY GLIDE: amount of *glissato* when playing instruments with a high dynamic on the keyboard. The higher the value, the stronger the *glissato* effect.
- PERCUSSION DECAY: decay time of an electromagnetic organ's percussion. The higher the value, the longer the decay time.
- PERCUSSION LEVEL: percussion level of electromagnetic organs. The higher the value, the higher the level.
- PRESENCE: sound presence; it simulates the dynamic of wind instruments. The higher the value, the stronger and richer the sound.
- RELEASE DETUNE: magnitude of tuning variation (to lower pitch) after a key has been released. The higher the value, the stronger the detuning.
- RELEASE TIME: time it takes for the sound to decay, after a key has been released. The higher the value, the longer the decay time.
- RELEASE NOISE: loudness of the hammer's noise (or finger's, in string instruments such as bass, double bass, guitar) when a key is released. The higher the value, the louder the release noise.
- STRETCHING TUNE: deviation from ideal tuning (corresponding to the equal temperament), according to a frequency distribution known as Railsback curve. In this way, low-pitched notes are slightly lower, while high-pitched ones are slightly higher. The higher the value, the stronger the deviation.
- SUSTAIN LEVEL: signal level during the Sustain phase of the sound. The sustain phase begins shortly after pressing the key and end when the key is released. The higher the value, the higher the sustain signal.
- SWEEP DEPTH: modulation depth of the cutoff frequency of the brightness filter. The higher the value, the deeper the modulation.
- SWEEP RATE: regluates the modulation speed of cutoff frequency of the brightness filter. The higher the value, the faster the modulation.
- VELOCITY FILTER: controls the influence of the dynamic, i.e. the pressure on the keyboard, on the cutoff frequency of the brightness filter. The higher the value, the more sensitive the keyboard.
- VEL. PERCUSSION: controls the influence of the dynamic, i.e. the pressure on the keyboard, on the volume of the percussion noise on electromagnetic organ Sounds. The higher the value, the more sensitive the keyboard.
- VELOCITY SENS.: controls the influence of the dynamic, i.e. the pressure on the keyboard, on the volume. The higher the value, the more sensitive the keyboard.
- VIBRATO DEPTH: modulation depth of the *vibrato* effect. The higher the value, the greater the modulation.
- VIBRATO RATE: modulation speed of the *vibrato* effect. The higher the value, the faster the modulation.

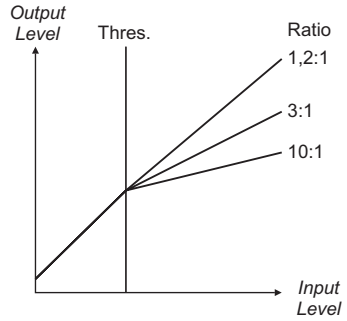
## 4.2 COMPRESSOR SECTION

Compressor effect parameters.

- **COMPRESSOR ON/OFF**
  Range: Off, On
  NRPN MSB=1, NRPN LSB=0
  Data Entry MSB Range: 0, 1
  Enables/disables the Compressor effect.

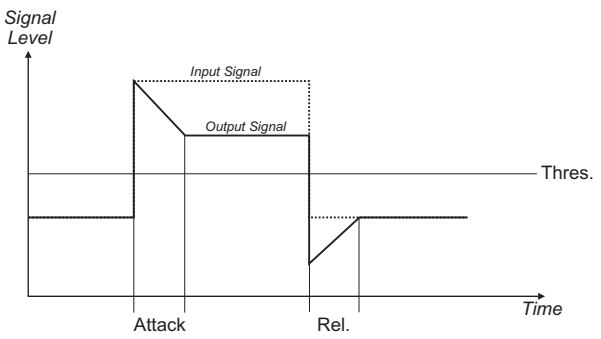
- **THRESSHOLD**
  Range: -36...0 dB
  NRPN MSB=1, NRPN LSB=1
  Data Entry MSB Range: 0...127
  Sets the signal level, also called theshold, by dB; the compressor only works above the Threshold.

- **RATIO**
  Range: 1,2:1...10:1
  NRPN MSB=1, NRPN LSB=2
  Data Entry MSB Range: 0...9
  Sets the quantity of compression of the dynamic range of the signal. It works based on a direct proportion. For example, if the compression rate is 1:1 there is no compression at all; with a compression rate of 3:1 the signal is three times more compact than the original.




- **ATTACK**
  Range: 0,50...200 msec.
  NRPN MSB=1, NRPN LSB=3
  Data Entry MSB Range: 0...127
  Sets the time (in millisecond) it takes for the effect to start lowering the signal, when it goes beyond the threshold. The higher the value, the longer it takes before the effect lowers the signal.

- **RELEASE**
  Range: 50...500 msec.
  NRPN MSB=1, NRPN LSB=4
  Data Entry MSB Range: 0...127
  Sets the time (in milliseconds) it takes for the effect to stop reducing the level, after the signal has returned below the threshold.




## 4.3 AMPLIFIER SECTION

Amplifier effect parameters.

- **AMPLIFIER ON/OFF**
  Range: Off, On
  NRPN MSB=2, NRPN LSB=0
  Data Entry MSB Range: 0, 1
  Enables/disables the Amplifier effect.

- **PRE- AMPLIFIER TYPE**
  Range:
  - 1...10: valve amp
  - 11...15: transistor amp
  - 16...19: an amp with more performant valves than the Tube

  NRPN MSB=2, NRPN LSB=1
  Data Entry MSB Range: 0...18
  Select the preamplifier type.

- **PRE- AMPLIFIER DRIVE**
  Range: 0...127
  NRPN MSB=2, NRPN LSB=2
  Data Entry MSB Range: 0...127
  Adjusts the pre-amplifier's gain.

- **HI DAMP**
  Range: 1k6...4k0
  NRPN MSB=2, NRPN LSB=3
  Data Entry MSB Range: 0...4
  Sets the cutoff frequency of the pre-amplifier's low-pass filter.

- **POWER AMPLIFIER TYPE**
  Range:
  - 1: a sweet combo, with lighter sounds
  - 2: a sharp-edged combo
  - 3: an amp with a rich sound
  - 4: loud combo with a strong presence and clean tone
  - 5: this amp highlights the middle frequencies
  - 6: this amp highlights mid-low frequencies

  NRPN MSB=2, NRPN LSB=4
  Data Entry MSB Range: 0...4
  Select the type of power amplifier.

- **POWER AMPLIFIER CHARACTER**
  Range: 0...127
  NRPN MSB=2, NRPN LSB=5
  Data Entry MSB Range: 0...127
  Adjust the amp's character.

- **CABINET TYPE**
  Range:
  - 1: direct injection box
  - 2: one-cone cabinet
  - 3: two-cone cabinet
  - 4: four-cone cabinet

  NRPN MSB=2, NRPN LSB=6
  Data Entry MSB Range: 0...4
  Sets the cabinet type.

- **CABINET COLOR**
  Range: 0...127
  NRPN MSB=2, NRPN LSB=7
  Data Entry MSB Range: 0...127
  Adjust the cabinet timbre.

- LEVEL
  Range: 0...127
  NRPN MSB=2, NRPN LSB=8
  Data Entry MSB Range: 0...127
  Sets the output level of the Amplifier effect.

## 4.4 EFX SECTION

Parameters of several effects.

- EFX ON/OFF
  Range: Off, On
  NRPN MSB=3 NRPN LSB=0
  Data Entry MSB Range: 0, 1
  Enables/disables the EFX section.

- DRY/WET
  Range: 0...127
  NRPN MSB=3 NRPN LSB=11
  Data Entry MSB Range: 0...127
  Balance between the original input signal (Value 0) and effect signal (Value 127)

### DELAY

The (echo) delay is an effect that generates separate repetition of the signal. Adding a feedback of the (delayed) output signal generates several repetions, each with a lower volume than the previous one.

- TYPE
  Range:
  - Mono: the delays are always mono, regardless of the currently selected sound (stereo or mono).
  - Stereo: delays are stereo, so with a stereo Sound also the repetitions keep the stereo panorama.
  - Ping Pong: echoes are generated alternating left and right channels.

  NRPN MSB=3, NRPN LSB=1
  Data Entry MSB Range: 0...2
  Select the type of echo.

- DELAY
  Range: 1...1500 msec.
  NRPN MSB=3 NRPN LSB=3
  Data Entry MSB Range: 0...127
  Sets the time (in milliseconds) between one echo and the following one.

- FEEDBACK
  Range: 0...127
  NRPN MSB=3 NRPN LSB=4
  Data Entry MSB Range: 0...127
  Sets the magnitude of the feedback signal, and therefore also the decay time of each echo.

- HI DAMP
  Range: 0...127
  NRPN MSB=3 NRPN LSB=5
  Data Entry MSB Range: 0...127
  Sets the cutoff frequency of a low-pass filter. This filter dampens the echoes with a frequency higher than the cutoff. Assign a relatively high value to this value in order to imitate analogic delays, with warmer and milder repetitions.

### CHORUS

Chorus is a modulation effect which adds to the original signal a slightly modified copy of it. The copy is slightly and cyclically detuned. The resulting sound is "thicker" and more spatialized than the original.

- TYPE
  Range:
  - Chorus 1: with one modulating signal.
  - Chorus 2: with two modulating signals in antiphase.
  - Chorus 3: with four modulating signals creating an antiphase between the left and right channels, with different speeds.
  - Chorus 4: with four modulating signals, each with its own phase.

  NRPN MSB=3 NRPN LSB=1
  Data Entry MSB Range: 3...6
  Select the Chorus type.

- DEPTH
  Range: 0...12 Hz
  NRPN MSB=3 NRPN LSB=3
  Data Entry MSB Range: 0...127
  Sets the modulation depth.

- SPEED
  Range: 0...12
  NRPN MSB=3 NRPN LSB=4
  Data Entry MSB Range: 0...127
  Sets the modulation speed in Hertz.

- DELAY
  Range: 0,10...20 msec
  NRPN MSB=3 NRPN LSB=5
  Data Entry MSB Range: 0...127
  Set a delay time (milliseconds), after which the effect starts modulating.

### FLANGER

The Flanger effect is similar to the Chorus; the only difference is that the Flanger elaborates and develops further the signal.

- TYPE
  Range:
  Flanger 1: with one modulating signal.
  Flanger 2: with two modulating signals in antiphase.
  NRPN MSB=3 NRPN LSB=1
  Data Entry MSB Range: 7, 8
  Select the Flanger type.

- DEPTH
  Range: 0...127
  NRPN MSB=3 NRPN LSB=3
  Data Entry MSB Range: 0...127
  Sets the modulation depth.

- SPEED
  Range: 0...12 Hz
  NRPN MSB=3 NRPN LSB=4
  Data Entry MSB Range: 0...127
  Sets the modulation speed, in Hertz.

- DELAY
  Range: 0,10...20 msec
  NRPN MSB=3 NRPN LSB=5
  Data Entry MSB Range: 0...127
  Sets a delay time, after which the effect starts the modulation.

- FEEDBACK
  Range: -63...0...+64
  NRPN MSB=3 NRPN LSB=6
  Data Entry MSB Range: 0...64...127
  Sets the quantity of signal to send back to the effect input as feedback; in this way the elaboration development of the signal can be controlled.

- HI DAMP
  Range: 0...127
  NRPN MSB=3 NRPN LSB=7
  Data Entry MSB Range: 0...127
  Sets the cutoff frequency of a low-pass filter; it makes the modulation softer and dampens the effect.

## VIBRATO

This effect modulates the frequency, producing a periodic tone variation; the length of the oscillation period and the modulation magnitude can be adjusted.

- TYPE
  Range:
  Vibrato 1: with one modulating signal.
  Vibrato 2: with two modulating signals in antiphase.
  NRPN MSB=3 NRPN LSB=1
  Data Entry MSB Range: 9, 10
  Select the Vibrato type.

- DEPTH
  Range: 0...12
  NRPN MSB=3 NRPN LSB=3
  Data Entry MSB Range: 0...127
  Sets the modulation depth.

- SPEED
  Range: 0...12 Hz
  NRPN MSB=3 NRPN LSB=4
  Data Entry MSB Range: 0...127
  Sets the modulation speed in Hertz.

- DELAY
  Range: 0,10...20 msec
  NRPN MSB=3 NRPN LSB=5
  Data Entry MSB Range: 0...127
  Sets a delay time, after which the effect starts the modulation.

## TREMOLO

Similar to the Vibrato, but instead of modulating the frequency, it modulates the amplitude (i.e. volume) of the sound.

- TYPE
  Range:
  Tremolo 1: with one modulating signal.
  Tremolo 2: with two modulating signals in antiphase.
  NRPN MSB=3 NRPN LSB=1
  Data Entry MSB Range: 11, 12
  Select the Tremolo type.

- DEPTH
  Range: 0...127
  NRPN MSB=3 NRPN LSB=3
  Data Entry MSB Range: 0...127
  Sets the modulation depth.

- SPEED
  Range: 0...12 Hz
  NRPN MSB=3 NRPN LSB=4
  Data Entry MSB Range: 0...127
  Sets the modulation speed in Hertz.

- SHAPE
  Range: 0...127
  NRPN MSB=3 NRPN LSB=5
  Data Entry MSB Range: 0...127
  Modifies the waveform of the modulating signal, so as to make it softer and smoother on higher values; the result is a softer effect.

## PHASER

Generally speaking, this effect works as a Chorus or Flanger; however, it does not add a new signal, altered in tone, to the original sound. Instead, the Phaser adds a new signal with an altered phase. In other words, the resulting effect is that of two machines playing the same tape but starting with a few milliseconds of distance. This causes some frequencies to be added up or cancelled, and is similar in sound to a Flanger, although weaker and "thinner".

- TYPE
  Range: 4, 6, 8, 12 Stage
  NRPN MSB=3 NRPN LSB=1
  Data Entry MSB Range: 12...15
  Select the Phaser type. Higher Stages generate an output signal that is richer in interferences.

- DEPTH
  Range: 0...12 Hz
  NRPN MSB=3 NRPN LSB=3
  Data Entry MSB Range: 0...127
  Sets the modulation depth.

- SPEED
  Range: 0...12
  NRPN MSB=3 NRPN LSB=4
  Data Entry MSB Range: 0...127
  Sets the modulation speed, in Hertz.

- FEEDBACK
  Range: 0...127
  NRPN MSB=3 NRPN LSB=5
  Data Entry MSB Range: 0...127
  Sets the quantity of signal that is sent back to the effect input as feedback; in this way the elaboration development of the signal can be controlled.

- MANUAL
  Range: 0...127
  NRPN MSB=3 NRPN LSB=6
  Data Entry MSB Range: 0...127
  Tune the modulation manually.

## PHA+TREM (PHASER+TREMOLO)

Phaser effect followed by Tremolo.

- PHASER DEPTH
  Range: 0...127
  NRPN MSB=3 NRPN LSB=3
  Data Entry MSB Range: 0...127
  Sets the Phaser's modulation depth.

- PHASER SPEED
  Range: 0...12 Hz
  NRPN MSB=3 NRPN LSB=4
  Data Entry MSB Range: 0...127
  Sets the Phaser's modulation speed, in Hertz.

- PHASER FEEDBACK
  Range: 0...127
  NRPN MSB=3 NRPN LSB=5
  Data Entry MSB Range: 0...127
  Sets the quantity of signal that is sent back to the Phaser input as feedback; in this way the elaboration development of the signal can be controlled.

- PHASER MANUAL
  Range: 0...127
  NRPN MSB=3 NRPN LSB=6
  Data Entry MSB Range: 0...127
  Tune the Phaser modulation manually.

- TREMOLO DEPTH
  Range: 0...127
  NRPN MSB=3 NRPN LSB=7
  Data Entry MSB Range: 0...127
  Sets the Tremolo's modulation depth.

- TREMOLO SPEED
  Range: 0...12 Hz
  NRPN MSB=3 NRPN LSB=8
  Data Entry MSB Range: 0...127
  Sets the Tremolo's modulation speed, in Hertz.

- TREMOLO PHASE
  Range: 0, 180
  NRPN MSB=3 NRPN LSB=9
  Data Entry MSB Range: 0, 1
  Sets the phase of the Tremolo's modulation signal.

- TREMOLO SHAPE
  Range: 0...127
  NRPN MSB=3 NRPN LSB=10
  Data Entry MSB Range: 0...127
  Modifies the waveform of the Tremolo's modulating signal, so as to make it softer and smoother on higher values; the result is a softer effect.

## WAH-WAH

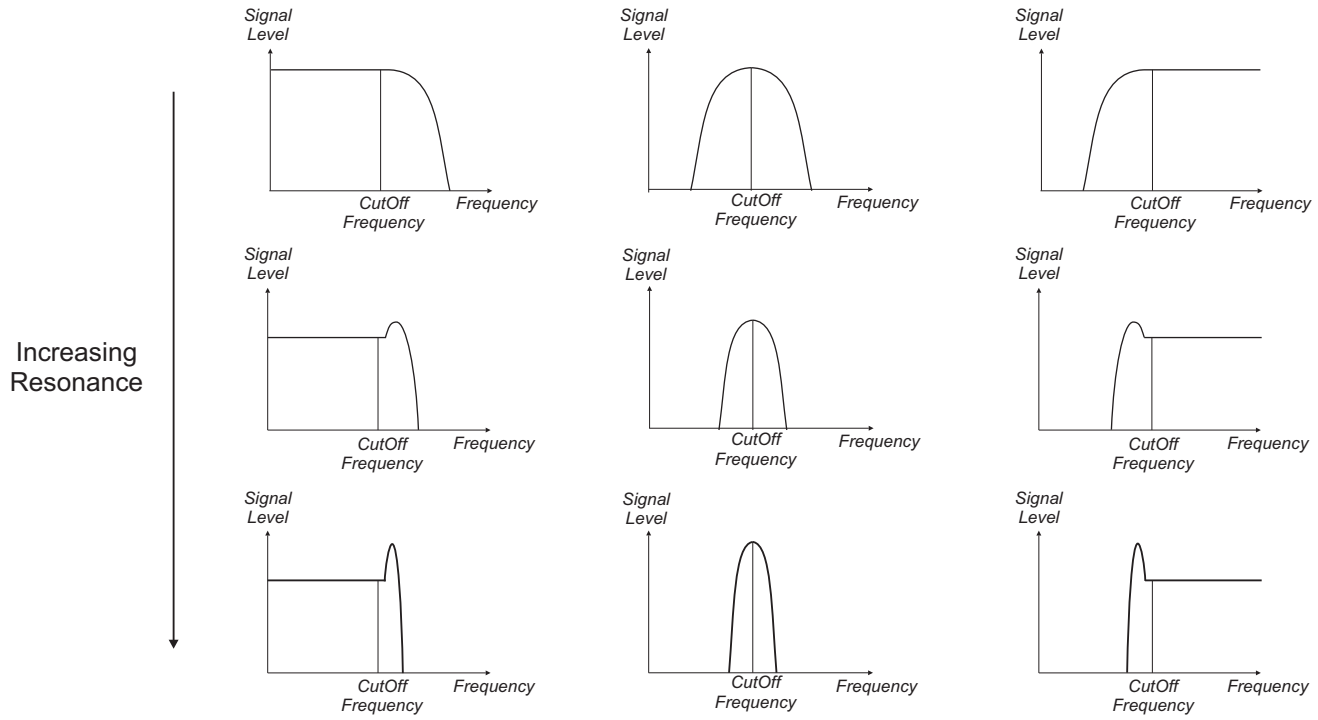
Simulates the classic guitar effect, that takes the name from its characteristic sound. It is in short a filter which is "shifted" along the frequency, so as to create a particular effect.

- TYPE
  Range:
  Auto: the cutoff frequency moves continuously and automatically (it is advisable to assign this MIDI message to a button, to activate/deactivate this mode).
  Touch: the cutoff frequency is set according to the dynamic, i.e. the pressure on the keyboard. The higher the dynamic (pressure), the higher the frequency (it is advisable to assign this MIDI message to a button, to activate/deactivate this mode).
  Pedal: the cutoff frequency is modified manually (it is advisable to assign the MIDI message to a pedal, slider, knob or wheel, to sensibly control the frequency).
  NRPN MSB=3 NRPN LSB=1
  Data Entry MSB Range: 16...18
  Sets the filter control type.

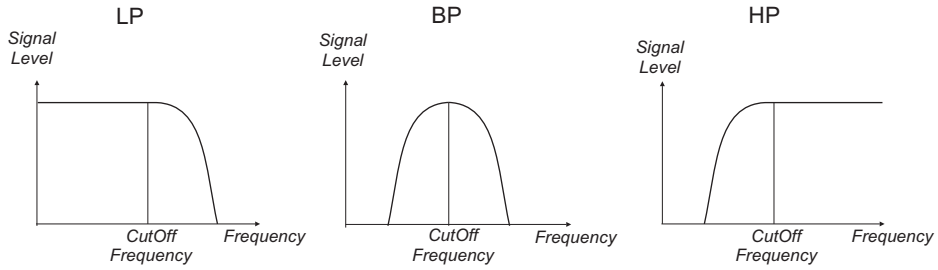
- TOP
  Range: 0...127
  NRPN MSB=3 NRPN LSB=3
  Data Entry MSB Range: 0...127
  Sets the filter's maximum cutoff frequency.

- BOTTOM
  Range: 0...127
  NRPN MSB=3 NRPN LSB=4
  Data Entry MSB Range: 0...127
  Sets the filter's minimum cutoff frequency.

- RESONANCE
  Range: 0...127
  NRPN MSB=3 NRPN LSB=5
  Data Entry MSB Range: 0...127
  Sets the filter's resonance curve, controlling how the frequencies close to the cutoff frequency are magnified. The higher the resonance value, the narrower the interval in which the frequencies are magnified; at the same time, the narrower the interval, the louder are the frequencies within that interval.




- **FILTER TYPE**
  Range:
  LP: low-pass filter, passes low-frequency signals and attenuates signals with frequencies higher than the cutoff frequency.
  BP: band-pass filter, attenuates all frequencies outside a certain range (band); the centre of this range is the cutoff frequency.
  HP: high-pass filter, passes high-frequency signals and attenuates signals with frequencies lower thatn the cutoff frequency.
  NRPN MSB=3 NRPN LSB=06
  Data Entry MSB Range: 0...2
  Select the type of filter.




- **SPEED (WITH TYPE=AUTO)**
  Range: Slow, Fast
  NRPN MSB=3 NRPN LSB=7
  Data Entry MSB Range: 0, 1
  Sets the speed at which the filter moves while in Auto mode.

- **SENSITIVITY (WITH TYPE=TOUCH)**
  Range: 0...127
  NRPN MSB=3 NRPN LSB=8
  Data Entry MSB Range: 0...127
  Adjust the filter's sensibility to dynamic (the pressure of fingers on the keys).

- **FOOT CONTROL (WITH TYPE=PEDAL)**
  Range: 0...127
  NRPN MSB=3 NRPN LSB=9
  Data Entry MSB Range: 0...127
  Assign this function to an expression pedal, to shift the filter in real time.

- **LEVEL**
  Range: 0...127
  NRPN MSB=3 NRPN LSB=08
  Data Entry MSB Range: 0...127
  Sets the output signal level.

## ROTARY

This effect simulates the classical electromagnetic organ rotating diffusor, with two selectable rotating speeds. A rotary creates a tremolo-like effect, with an "open" sound.

- **TYPE**
  Range:
  2 Rotors: two rotors, one for low and one for high frequencies; the two speakers rotate at different speed, so as to create a highly modulated sound.
  1 Rotor: one rotor, moving the high-frequency speaker.
  NRPN MSB=3 NRPN LSB=1
  Data Entry MSB Range: 19, 20
  Select the amount of electric rotors for the effect

- **SLOW SPEED**
  Range: 0...127
  NRPN MSB=3 NRPN LSB=03
  Data Entry MSB Range: 0...127
  Sets the rotation speed of the Slow mode.

- **FAST SPEED**
  Range: 0...127
  NRPN MSB=3 NRPN LSB=04
  Data Entry MSB Range: 0...127
  Sets the rotation speed of the Fast mode.

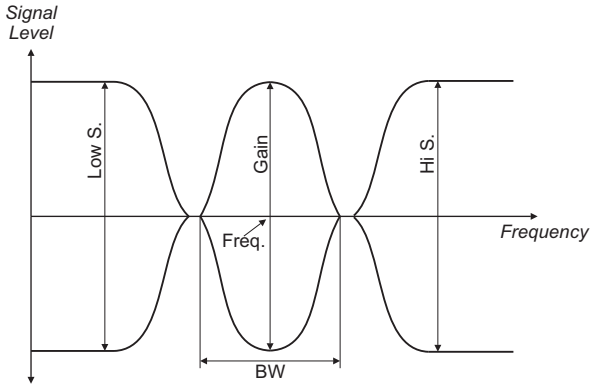
- **BALANCE**
  Range: 0...127
  NRPN MSB=3 NRPN LSB=05
  Data Entry MSB Range: 0...127
  Balance between low (Value 0) and high sounds (Value 127)

- **SPEED**
  Range:
  Slow: lenta
  Fast: veloce
  NRPN MSB=3 NRPN LSB=06
  Data Entry MSB Range: 0, 1
  Selects the two speed (Fast, Slow).

- **RISE/FALL**
  Range: 0...127
  NRPN MSB=3 NRPN LSB=07
  Data Entry MSB Range: 0...127
  Sets the transition time needed to switch between Slow and Fast modes.

# 4.5 EQUALIZER SECTION

Parameters to adjust the equalizer dedicated to the currently selected Sound (not the Master Equalizer which is indipendent to the select Sound).




- **LOW SHELF**
  Range: -12...0...+12 dB
  NRPN MSB=3 NRPN LSB=02
  Data Entry MSB Range: 52...64...76
  Gain (positive value) or dampening (negative values) of low signals (frequencies below 180 Hz).

- **FREQUENCY**
  Range: 300...4800 Hz
  NRPN MSB=3 NRPN LSB=03
  Data Entry MSB Range: 0...127
  Select the frequencies controlled by the GAIN parameter.

- **BANDWIDTH**
  Range: 0,50....3
  NRPN MSB=3 NRPN LSB=04
  Data Entry MSB Range: 0...127
  Bandwidth of the middle filter, that is, the extension of frequencies on both sides of the FREQUENCY, that are controlled by the GAIN parameter.

- **GAIN**
  Range: -12...0...+12 dB
  NRPN MSB=3 NRPN LSB=05
  Data Entry MSB Range: 52...64...76
  Gain (positive value) or dampening (negative values) of frequencies set by the FREQUENCY parameter.

- **HI SHELF**
  Range: -12...0...+12 dB
  NRPN MSB=3 NRPN LSB=06
  Data Entry MSB Range: 52...64...76
  Gain (positive value) or attenuation (negative values) of high signals (frequencies above 6,3 KHz).

## 4.6 MIXER SECTION

Parameters to control the volume of Sound, the signal level sent to Master Effect and Master Reverb, and also the output's stereophonic distribution.

- VOLUME
  Range: 0...127
  CC: 7
  Value Range: 0...127
  Sets the SOUND ENGINE output signal level.

- PAN
  Range: 0...64...127
  CC: 10
  Value Range: 0...64...127
  Stereophonic distribution, or panning. Value 0 corresponds to the left output, while 127 to the right output. Value 64 corresponds to a perflect balance between left and right output.

- REVERB SEND
  Range: 0...127
  CC: 91
  Value Range: 0...127
  Signal level sent to the MASTER REVERB section.

- EFX SEND
  Range: 0...127
  CC: 93
  Value Range: 0...127
  Signal level sent to the MASTER EFFECT section.

## 4.7 MASTER EFFECT SECTION

Parameters that modify the master effect.

- MASTER EFFECT ON/OFF
  Range: Off, On
  NRPN MSB=6 NRPN LSB=0
  Data Entry MSB Range: 0, 1
  Enables/disables the MASTER EFFECT section.

- LEVEL
  Range: 0...127
  NRPN MSB=6 NRPN LSB=6
  Data Entry MSB Range: 0...127
  Sets the output signal level.

### DELAY

The Delay (or echo) generates repetitions of the input signal. Part of the output signal can be returned to the input as feedback, so as to generate several different repetitions each one with a lower level than the previous.

- TYPE
  Range:
  - Mono: the delays are always mono, regardless of the currently selected sound (stereo or mono).
  - Stereo: delays are stereo, so with a stereo Sound also the repetitions keep the stereo panorama.
  - Ping Pong: echoes are generated alternating left and right channels.

  NRPN MSB=6, NRPN LSB=1
  Data Entry MSB Range: 0...2
  Selects the delay type.

- DELAY
  Range: 1...1500 msec.
  NRPN MSB=6 NRPN LSB=3
  Data Entry MSB Range: 0...127
  Sets the time between echoes, in milliseconds.

- FEEDBACK
  Range: 0...127
  NRPN MSB=6 NRPN LSB=4
  Data Entry MSB Range: 0...127
  Sets the quantity of signal that is sent back to the input as feedback. This affects the echoes' decay time.

- HI DAMP
  Range: 0...127
  NRPN MSB=6 NRPN LSB=5
  Data Entry MSB Range: 0...127
  Sets the cutoff frequency of a low-pass filter, that dampens the echoes with a higher frequency. By setting a high value, the effect willresemble an old-fashioned, analog or tape delay. Echoes will sound "warmer" and "softer".

### CHORUS

Chorus is a modulation effect which adds to the original signal a slightly modified copy of it. The copy is cyclically detuned. The resulting sound is "thicker" and more spatialized than the original.

- TYPE
  Range:
  - Chorus 1: with one modulating signal.
  - Chorus 2: with two modulating signals in antiphase.
  - Chorus 3: with four modulating signals creating an antiphase between the left and right channels, with different speeds.
  - Chorus 4: with four modulating signals, each with its own phase.

  NRPN MSB=6 NRPN LSB=1
  Data Entry MSB Range: 3...6
  Select the Chorus type,

- DEPTH
  Range: 0...12 Hz
  NRPN MSB=6 NRPN LSB=3
  Data Entry MSB Range: 0...127
  Sets the modulation depth.

- SPEED
  Range: 0...12
  NRPN MSB=6 NRPN LSB=4
  Data Entry MSB Range: 0...127
  Sets the modulation speed in Hertz.

- DELAY
  Range: 0,10...20 msec
  NRPN MSB=6 NRPN LSB=5
  Data Entry MSB Range: 0...127
  Sets a delay time (milliseconds), after which the effect starts modulating.

## 4.8 MASTER REVERB SECTION

Master reverb parameters.
A reverb is the sum of different acoustic reflections, created by sound in a natural environment. For example, when clapping hands inside a large space, such as a church, the sound will resonate and slowly decay. Large rooms and halls create reverb. The acoustic effect depends on many different factors, such as the room's size and shape, the material covering the walls and so on.

- MASTER REVERB ON/OFF
  Range: Off, On
  NRPN MSB=7 NRPN LSB=0
  Data Entry MSB Range: 0, 1
  Enables/disables the MASTER REVERB section.

- TYPE
  Range:
  - Small Room: a small room with very absorbing walls.
  - Large Room: a medium room with slightly absorbing walls.
  - Small Hall: a small hall with reflective walls, such as a small church.
  - Medium Hall: a medium hall with very reflective walls.
  - Large Hall: a large hall with very reflective walls, such as a cathedral.
  - Plate: reverb simulation generated by a metal plate, a technique used in the '70s.
  - Spring: reverb simulation generated by a spring, a technique used in the '70s with amplifiers.
  - Tape: reverb simulation generated by an analog tape, by recording and replaying the final portion of the reverberated sound.

  NRPN MSB=7 NRPN LSB=1
  Data Entry MSB Range: 0...7
  Select the type of room generating the reverb,

- TIME
  Range: 0...127
  NRPN MSB=7 NRPN LSB=2
  Data Entry MSB Range: 0...127
  Sets the time of reverbetations.

- HI DAMP
  Range: 0...127
  NRPN MSB=7 NRPN LSB=3
  Data Entry MSB Range: 0...127
  Sets the cutoff frequency of a low-pass filter, that dampens the reverberated signal with a higher frequency, softening the effect.

- LOW GAIN
  Range: -0,6...0...0,6 dB
  NRPN MSB=7 NRPN LSB=4
  Data Entry MSB Range: 0...127
  Sets the gain (positive values) or attenuation (negative values) of low frequencies.

- HIGH GAIN
  Range: -0,6...0...0,6 dB
  NRPN MSB=7 NRPN LSB=5
  Data Entry MSB Range: 0...127
  Sets the gain (positive values) or attenuation (negative values) of high frequencies.

- LEVEL
  Range: 0...127
  NRPN MSB=7 NRPN LSB=6
  Data Entry MSB Range: 0...127
  Sets the output signal level.

## 4.9 MASTER EQUALIZER SECTION

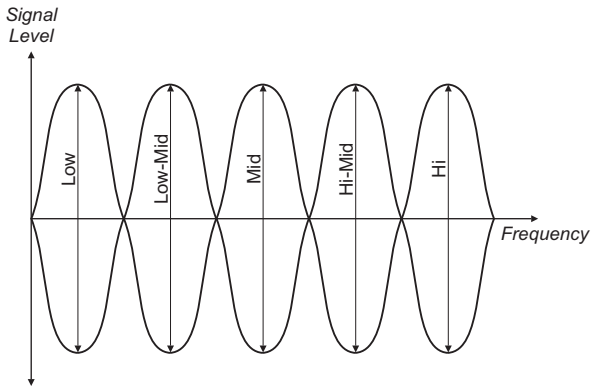
Master equalizer parameters.

- MASTER EQUALIZER ON/OFF
  Range: Off, On
  NRPN MSB=8 NRPN LSB=0
  Data Entry MSB Range: 0, 1
  Enables/disables the MASTER EQUALIZER section.

- MASTER EQUALIZER TYPE
  Range: Parametric, Graphic
  NRPN MSB=8 NRPN LSB=1
  Data Entry MSB Range: 0, 1
  Sets the equalizer type (graphic or parameter).

### GRAPHIC

A graphic equalizer controls certain preset frequency bands. Each band can be boosted or attenuated.




- LOW
  Range: -12...0...+12 dB
  NRPN MSB=8 NRPN LSB=2
  Data Entry MSB Range: 52...64...76
  Gain (positive values) or attenuation (negative values) of signals with frequencies around 180 Hz.

- LOW-MID
  Range: -12...0...+12 dB
  NRPN MSB=8 NRPN LSB=3
  Data Entry MSB Range: 52...64...76
  Gain (positive values) or attenuation (negative values) of signals with frequencies around 350 Hz.

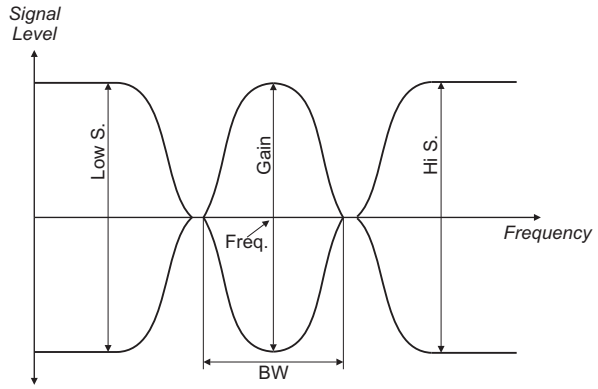
- MID
  Range: -12...0...+12 dB
  NRPN MSB=8 NRPN LSB=4
  Data Entry MSB Range: 52...64...76
  Gain (positive values) or attenuation (negative values) of signals with frequencies around 1 KHz.

- HI-MID
  Range: -12...0...+12 dB
  NRPN MSB=8 NRPN LSB=5
  Data Entry MSB Range: 52...64...76
  Gain (positive values) or attenuation (negative values) of signals with frequencies around 1,8 KHz.

- HI
  Range: -12...0...+12 dB
  NRPN MSB=8 NRPN LSB=6
  Data Entry MSB Range: 52...64...76
  Gain (positive values) or attenuation (negative values) of signals with frequencies around 6,3 KHz.

## PARAMETRIC

A parametric equalizer is composed of three sections. Two similar sections are used to boost/dampen the extreme frequency bands, that is, low band (Low S.) and high band (Hi S.). A third band (BW) can be assigned a middle frequency range. Reference frequency, boosting/dampening and bandwidth can all be set manually.




- LOW SHELF
  Range: -12...0...+12 dB
  NRPN MSB=3 NRPN LSB=02
  Data Entry MSB Range: 52...64...76
  Gain (positive values) or attenuation (negative values) of signals with frequencies below 180 Hz.

- FREQUENCY
  Range: 300...4800 Hz
  NRPN MSB=3 NRPN LSB=03
  Data Entry MSB Range: 0...127
  Set the reference frequency controlled by the *Gain* parameter.

- BANDWIDTH
  Range: 0,50....3
  NRPN MSB=3 NRPN LSB=04
  Data Entry MSB Range: 0...127
  Bandwidth of the middle filter, that is, the extension of frequencies on both sides of the FREQUENCY, that are controlled by the GAIN parameter.

- GAIN
  Range: -12...0...+12 dB
  NRPN MSB=3 NRPN LSB=05
  Data Entry MSB Range: 52...64...76
  Gain (positive values) or attenuation (negative values) of signals with frequencies around the the one set through the FREQUENCY parameter.

- HI SHELF
  Range: -12...0...+12 dB
  NRPN MSB=3 NRPN LSB=06
  Data Entry MSB Range: 52...64...76
  Gain (positive values) or attenuation (negative values) of signals with frequencies above 6,3 KHz.

# 5. SOUND LIST

| Bank Select MSB - LSB | Program Change | Sound Name | Sound Type | Compr. | Amp. | Efx | Eq. |
|---|---|---|---|---|---|---|---|
| 000 - 000 | 001 | φITA Concert Grand | φPiano | --- | --- | --- | --- |
| 000 - 000 | 002 | φUS Stage Grand D | φPiano | --- | --- | --- | --- |
| 000 - 000 | 003 | φPL Vintage Grand | φPiano | --- | --- | --- | --- |
| 000 - 000 | 004 | φEU Jazz Ages | φPiano | --- | --- | --- | X |
| 000 - 000 | 005 | φUS Jazz Grand | φPiano | --- | --- | --- | X |
| 000 - 000 | 006 | φOpen Rock Grand | φPiano | --- | --- | --- | X |
| 000 - 000 | 007 | φRomantic Grand | φPiano | --- | --- | --- | X |
| 000 - 000 | 008 | φSmooth Bigframe | φPiano | --- | --- | --- | X |
| 000 - 000 | 009 | φClear Bigframe | φPiano | --- | --- | --- | X |
| 000 - 000 | 010 | φJ6 Classic Grand | φPiano | --- | --- | --- | --- |
| 000 - 000 | 011 | φJ6 Modern Grand | φPiano | --- | --- | --- | X |
| 000 - 000 | 012 | φUS Classic C | φPiano | --- | --- | --- | --- |
| 000 - 000 | 013 | φUS Hard Ambient | φPiano | --- | --- | --- | X |
| 000 - 000 | 014 | φEU Baby Half Lid | φPiano | --- | --- | --- | --- |
| 000 - 000 | 015 | φEU Baby Open Lid | φPiano | --- | --- | --- | --- |
| 000 - 000 | 016 | φNew Orleans | φPiano | --- | --- | --- | X |
| 000 - 000 | 017 | φSmooth Baby Grand | φPiano | --- | --- | --- | X |
| 000 - 000 | 018 | φDisused Baby | φPiano | --- | --- | --- | X |
| 000 - 000 | 019 | φLennon Piano | φPiano | --- | --- | Delay | X |
| 000 - 000 | 020 | φPercussive Piano | φPiano | --- | --- | Delay | X |
| 000 - 000 | 021 | φUpright Open | φPiano | --- | --- | --- | --- |
| 000 - 000 | 022 | φUpright Closed | φPiano | --- | --- | --- | --- |
| 000 - 000 | 023 | φUpright Club | φPiano | --- | --- | --- | X |
| 000 - 000 | 024 | φSaloon Upright | φPiano | --- | --- | --- | --- |
| 000 - 000 | 025 | φElectric Grand | φPiano | --- | --- | --- | --- |
| 000 - 000 | 026 | φElectric Stage | φPiano | --- | --- | --- | X |
| 000 - 000 | 027 | φE.Grand & Chorus | φPiano | --- | --- | Chorus | X |
| 000 - 000 | 028 | φE.G. Funky Pluck | φPiano | --- | X | Phaser | X |
| 000 - 000 | 029 | φDigit.Piano Pop | φPiano | --- | --- | --- | X |
| 000 - 000 | 030 | φDigit.Piano House | φPiano | --- | --- | Chorus | X |
| 000 - 000 | 031 | φToy Piano | φPiano | --- | --- | --- | X |
| 000 - 000 | 032 | φMr Cage | φPiano | --- | --- | --- | --- |
| 000 - 000 | 033 | φUS Grand 2 | φPiano | --- | --- | --- | X |
| 000 - 000 | 034 | φUS Jazz 2 | φPiano | --- | --- | --- | X |
| 000 - 000 | 035 | φUS Mellow | φPiano | --- | --- | --- | X |
| 000 - 000 | 036 | φITA Grand 2 | φPiano | --- | --- | --- | X |
| 000 - 000 | 037 | φITA Stage 2 | φPiano | --- | --- | --- | X |
| 000 - 000 | 038 | φJN-1 | φPiano | --- | --- | --- | X |
| 001 - 000 | 001 | φVintage Case | φRhody | --- | --- | --- | X |
| 001 - 000 | 002 | φHard Hammer | φRhody | --- | --- | --- | X |
| 001 - 000 | 003 | φSuit Phase | φRhody | --- | --- | Phaser | X |
| 001 - 000 | 004 | φ'75 Suitcase | φRhody | --- | --- | Tremolo | X |
| 001 - 000 | 005 | φMax Tine | φRhody | --- | --- | Chorus | X |
| 001 - 000 | 006 | φHip Hop Case | φRhody | --- | --- | Tremolo | X |
| 001 - 000 | 007 | φBelltine | φRhody | --- | --- | Tremolo | X |
| 001 - 000 | 008 | φHard Case | φRhody | --- | --- | Tremolo | X |
| 001 - 000 | 009 | φVintage Fusion | φRhody | --- | --- | Wah-wah | X |
| 001 - 000 | 010 | φR'n'B | φRhody | --- | --- | Tremolo | X |
| 001 - 000 | 011 | φSweet Tine | φRhody | --- | --- | Phaser+Tremolo | X |
| 001 - 000 | 012 | φSaturation Case | φRhody | --- | X | Tremolo | X |
| 001 - 000 | 013 | φDream Tine | φRhody | --- | --- | Phaser+Tremolo | X |
| 001 - 000 | 014 | φTouch Case | φRhody | --- | --- | Wah-wah | X |
| 001 - 000 | 015 | φVintage Soul | φRhody | --- | --- | Tremolo | X |
| 001 - 000 | 016 | φFly Case | φRhody | --- | --- | Flanger | X |
| 001 - 000 | 017 | φEarly Case | φRhody | --- | --- | Tremolo | --- |
| 001 - 000 | 018 | φStomp Dyno | φRhody | X | X | Tremolo | X |

| Bank Select MSB - LSB | Program Change | Sound Name | Sound Type | Compr. | Amp. | Efx | Eq. |
|---|---|---|---|---|---|---|---|
| 001 - 000 | 019 | φWurly Bright | φWurly | --- | X | --- | --- |
| 001 - 000 | 020 | φClassroom Wurly | φWurly | --- | X | Tremolo | X |
| 001 - 000 | 021 | φClassPhase | φWurly | --- | X | Phaser+Tremolo | X |
| 001 - 000 | 022 | φSweet Wurly | φWurly | --- | X | --- | X |
| 001 - 000 | 023 | φWurly Saturation | φWurly | --- | X | --- | X |
| 001 - 000 | 024 | φAmbient Wurly | φWurly | X | X | Tremolo | X |
| 001 - 000 | 025 | φD6 Clavi | φClavy | --- | --- | --- | --- |
| 001 - 000 | 026 | φD6 Old | φClavy | --- | X | --- | --- |
| 001 - 000 | 027 | φProggy Harpsi | φClavy | --- | X | --- | X |
| 001 - 000 | 028 | φE7 Clavi | φClavy | --- | X | --- | --- |
| 001 - 000 | 029 | φStudio Clavi | φClavy | --- | X | Phaser | X |
| 001 - 000 | 030 | φE7 Back | φClavy | --- | --- | --- | X |
| 001 - 000 | 031 | φCompaniClavi | φClavy | --- | X | Phaser+Tremolo | X |
| 001 - 000 | 032 | φPiany | φPiany | --- | --- | Tremolo | --- |
| 001 - 000 | 033 | φ70 Tine | φRhody | --- | --- | Tremolo | X |
| 001 - 000 | 034 | φTea Tine | φRhody | --- | --- | Phaser+Tremolo | X |
| 001 - 000 | 035 | φMk 80 | φRhody | --- | --- | Tremolo | X |
| 001 - 000 | 036 | φMk Sweet II | φRhody | --- | --- | Phaser+Tremolo | X |
| 001 - 000 | 037 | φD6-CA | φClavy | --- | --- | --- | X |
| 001 - 000 | 038 | φD6-CB | φClavy | --- | --- | --- | X |
| 001 - 000 | 039 | φD6-DA | φClavy | --- | --- | --- | X |
| 001 - 000 | 040 | φD6-DB | φClavy | --- | --- | --- | X |
| 001 - 000 | 041 | φE7-CA | φClavy | --- | --- | --- | X |
| 001 - 000 | 042 | φE7-CB | φClavy | --- | --- | --- | X |
| 001 - 000 | 043 | φE7-DA | φClavy | --- | --- | --- | X |
| 001 - 000 | 044 | φE7-DB | φClavy | --- | --- | --- | X |
| 001 - 000 | 045 | φMKI Snap | φRhody | --- | --- | --- | X |
| 001 - 000 | 046 | φMKII Snap | φRhody | --- | --- | --- | X |
| 001 - 000 | 047 | φPsyco EP | φRhody | --- | --- | Wah-wah | --- |
| 001 - 000 | 048 | φNo Quarter | φRhody | --- | --- | Phaser | --- |
| 001 - 000 | 049 | φJoe Phase '80 | φRhody | --- | --- | Phaser | X |
| 002 - 000 | 001 | φVibraphone | φMallet | --- | --- | --- | --- |
| 002 - 000 | 002 | φVibraphone Jazz | φMallet | --- | --- | --- | X |
| 002 - 000 | 003 | φCrystal Dream | φMallet | --- | --- | Chorus | X |
| 002 - 000 | 004 | φHard Vibraphone | φMallet | --- | --- | --- | --- |
| 002 - 000 | 005 | φVibe Slow&Warm | φMallet | --- | --- | --- | --- |
| 002 - 000 | 006 | φStopped Vibe | φMallet | --- | --- | --- | X |
| 002 - 000 | 007 | φVibe Fast Rotor | φMallet | --- | --- | --- | X |
| 002 - 000 | 008 | φFantasy Vibe | φMallet | --- | --- | Flanger | X |
| 002 - 000 | 009 | φEcho Phone | φMallet | --- | --- | Delay | --- |
| 002 - 000 | 010 | φMarimba | φMallet | --- | --- | --- | --- |
| 002 - 000 | 011 | φFollow Marimba | φMallet | --- | --- | Chorus | X |
| 002 - 000 | 012 | φWoodblock | φMallet | --- | --- | --- | X |
| 002 - 000 | 013 | φRotor Marimba | φMallet | --- | --- | --- | --- |
| 002 - 000 | 014 | φAmbient Marimba | φMallet | --- | --- | Chorus | X |
| 002 - 000 | 015 | φWarm Marimba | φMallet | --- | --- | --- | --- |
| 002 - 000 | 016 | φWow Marimba | φMallet | --- | --- | Wah-wah | X |
| 002 - 000 | 017 | φ Alien Marimba | φMallet | --- | --- | Flanger | X |
| 002 - 000 | 018 | φGlockenspiel | φMallet | --- | --- | --- | --- |
| 002 - 000 | 019 | φGlocken Short | φMallet | --- | --- | --- | --- |
| 002 - 000 | 020 | φGlocken | φMallet | --- | --- | --- | --- |
| 002 - 000 | 021 | φVibeglock | φMallet | --- | --- | --- | X |
| 002 - 000 | 022 | φWarm Bell | φMallet | --- | --- | --- | X |
| 002 - 000 | 023 | φPop Bell | φMallet | --- | --- | Chorus | X |
| 002 - 000 | 024 | φSmooth Bell | φMallet | --- | --- | Chorus | X |
| 002 - 000 | 025 | φXylophone | φMallet | --- | --- | --- | --- |
| 002 - 000 | 026 | φSoft Xylophone | φMallet | --- | --- | --- | --- |
| 002 - 000 | 027 | φXylofollow | φMallet | --- | --- | Chorus | --- |
| 002 - 000 | 028 | φXylo | φMallet | --- | --- | --- | X |
| 002 - 000 | 029 | φStrange Wood | φMallet | --- | --- | Wah-wah | --- |
| 002 - 000 | 030 | φSoftwood | φMallet | --- | --- | Chorus | X |

| Bank Select MSB - LSB | Program Change | Sound Name | Sound Type | Compr. | Amp. | Efx | Eq. |
|---|---|---|---|---|---|---|---|
| 002 - 000 | 031 | φBali Dream | φMallet | --- | --- | Chorus | X |
| 002 - 000 | 032 | φCelesta | φMallet | --- | --- | --- | --- |
| 003 - 000 | 001 | DX Legend | FM Piano | --- | --- | --- | X |
| 003 - 000 | 002 | 80`s Memories | FM Piano | --- | --- | Chorus | X |
| 003 - 000 | 003 | DX II FX | FM Piano | --- | --- | Chorus | X |
| 003 - 000 | 004 | DX II MJ | FM Piano | --- | --- | Flanger | X |
| 003 - 000 | 005 | Gospel Organ | E. Organ | --- | --- | Rotary | X |
| 003 - 000 | 006 | Full Organ | E. Organ | --- | --- | Rotary | X |
| 003 - 000 | 007 | Mr Lord | E. Organ | --- | X | Rotary | X |
| 003 - 000 | 008 | Mr Brian | E. Organ | --- | X | --- | X |
| 003 - 000 | 009 | Hot Organ | E. Organ | X | X | Rotary | X |
| 003 - 000 | 010 | Hard Rock Organ | E. Organ | --- | X | Rotary | X |
| 003 - 000 | 011 | Mr Jimmy | E. Organ | --- | X | Rotary | X |
| 003 - 000 | 012 | Open the Doors | E. Organ | X | X | Rotary | X |
| 003 - 000 | 013 | Soft Organ | E. Organ | --- | X | Rotary | X |
| 003 - 000 | 014 | Mr Keith | E. Organ | X | X | Rotary | X |
| 003 - 000 | 015 | 70ies | E. Organ | --- | --- | Rotary | X |
| 003 - 000 | 016 | Gimme some Rock | E. Organ | --- | X | Rotary | X |
| 003 - 000 | 017 | Lower Manual | E. Organ | --- | --- | Rotary | X |
| 003 - 000 | 018 | Harpsichord | Harpsi | --- | --- | --- | --- |
| 003 - 000 | 019 | Double Harpsichord | Harpsi | --- | --- | --- | X |
| 003 - 000 | 020 | Spinet | Harpsi | --- | --- | --- | X |
| 003 - 000 | 021 | Virginal | Harpsi | --- | --- | --- | X |
| 003 - 000 | 022 | Principal 8' | C. Organ | --- | --- | --- | X |
| 003 - 000 | 023 | Principal Chorus | C. Organ | --- | --- | --- | X |
| 003 - 000 | 024 | Plenum | C. Organ | --- | --- | --- | --- |
| 003 - 000 | 025 | Flutes and Nazard | C. Organ | --- | --- | --- | X |
| 003 - 000 | 026 | Celeste | C. Organ | --- | --- | --- | X |
| 003 - 000 | 027 | Echo Flues | C. Organ | --- | --- | --- | X |
| 003 - 000 | 028 | Positive Organ | C. Organ | --- | --- | --- | X |
| 003 - 000 | 029 | Accordion | Accordion | --- | --- | --- | --- |
| 003 - 000 | 030 | Musette | Accordion | --- | --- | --- | --- |
| 003 - 000 | 031 | Bandoneon | Accordion | --- | --- | --- | --- |
| 003 - 000 | 032 | Harmonium | Accordion | --- | --- | --- | --- |
| 004 - 000 | 001 | Chamber Trio | Strings | --- | --- | --- | X |
| 004 - 000 | 002 | Cellos | Strings | --- | --- | --- | X |
| 004 - 000 | 003 | Supreme Strings | Strings | --- | --- | Delay | X |
| 004 - 000 | 004 | Warm Strings | Strings | --- | --- | --- | X |
| 004 - 000 | 005 | Octave Ensemble | Strings | --- | --- | Delay | X |
| 004 - 000 | 006 | Strings Orchestra | Strings | --- | --- | --- | X |
| 004 - 000 | 007 | Slow Ensemble | Strings | --- | --- | Delay | X |
| 004 - 000 | 008 | Marcato | Strings | --- | --- | --- | X |
| 004 - 000 | 009 | Tremolo Strings | Strings | --- | --- | Tremolo | X |
| 004 - 000 | 010 | Dark Octave | Strings | --- | --- | --- | X |
| 004 - 000 | 011 | HornsStrings | Brass | --- | --- | --- | X |
| 004 - 000 | 012 | Velo Horns | Brass | --- | --- | --- | X |
| 004 - 000 | 013 | Brass Band | Brass | --- | --- | --- | X |
| 004 - 000 | 014 | Big Band | Brass | --- | --- | Delay | X |
| 004 - 000 | 015 | Choir OHS | Brass | --- | --- | --- | X |
| 004 - 000 | 016 | Choir AHS | Brass | --- | --- | --- | X |
| 004 - 000 | 017 | Synth Strings1 | Synth / Pad | --- | --- | Phaser+Tremolo | X |
| 004 - 000 | 018 | Synth Strings2 | Synth / Pad | --- | --- | Phaser+Tremolo | X |
| 004 - 000 | 019 | Synth Strings3 | Synth / Pad | --- | --- | Chorus | X |
| 004 - 000 | 020 | Horns Pad | Synth / Pad | --- | --- | Chorus | X |
| 004 - 000 | 021 | Warm Pad | Synth / Pad | --- | --- | --- | X |
| 004 - 000 | 022 | Odyssey | Synth / Pad | --- | --- | Phaser+Tremolo | X |
| 004 - 000 | 023 | Galaxy Pad | Synth / Pad | --- | X | Flanger | X |
| 004 - 000 | 024 | Ob Z-Pad | Synth / Pad | --- | --- | --- | X |
| 004 - 000 | 025 | Space Wind | Synth / Pad | --- | --- | Phaser | X |
| 004 - 000 | 026 | Quasar | Synth / Pad | --- | --- | Flanger | X |
| 004 - 000 | 027 | Sweeper | Synth / Pad | --- | --- | --- | X |

| Bank Select MSB - LSB | Program Change | Sound Name | Sound Type | Compr. | Amp. | Efx | Eq. |
|---|---|---|---|---|---|---|---|
| 004 - 000 | 028 | Synth Brass | Synth / Pad | --- | --- | Delay | X |
| 004 - 000 | 029 | Synth Horns | Synth / Pad | --- | --- | --- | X |
| 004 - 000 | 030 | OB Horns | Synth / Pad | --- | X | Tremolo | X |
| 004 - 000 | 031 | Jump | Synth / Pad | --- | --- | Chorus | X |
| 004 - 000 | 032 | Synth Qua | Synth / Pad | --- | --- | Delay | X |
| 005 - 000 | 001 | Upright | Ac. Bass | --- | --- | --- | X |
| 005 - 000 | 002 | Fat Jazz Bass | Ac. Bass | --- | X | --- | X |
| 005 - 000 | 003 | Fretless | El. Bass | --- | X | --- | --- |
| 005 - 000 | 004 | Dynamic Fretless | El. Bass | --- | X | --- | --- |
| 005 - 000 | 005 | Chorus Bass | El. Bass | --- | X | Chorus | X |
| 005 - 000 | 006 | Fingered Bass | El. Bass | --- | X | --- | --- |
| 005 - 000 | 007 | Mid Amp Finger | El. Bass | --- | X | --- | X |
| 005 - 000 | 008 | Active Prec Bass | El. Bass | --- | X | --- | X |
| 005 - 000 | 009 | Pick Mute Bass | El. Bass | --- | X | --- | X |
| 005 - 000 | 010 | Pick Hot Tube | El. Bass | --- | X | --- | X |
| 005 - 000 | 011 | Soft Slap | El. Bass | --- | X | --- | X |
| 005 - 000 | 012 | Slap It! | El. Bass | --- | X | --- | --- |
| 005 - 000 | 013 | Synth Bass 1 | El. Bass | --- | X | --- | --- |
| 005 - 000 | 014 | Synth Bass 2 | El. Bass | --- | X | --- | --- |
| 005 - 000 | 015 | Synth Bass 3 | El. Bass | --- | --- | Vibrato | --- |
| 005 - 000 | 016 | Nylon Guitar | Ac. Guitar | --- | --- | Delay | X |
| 005 - 000 | 017 | Steel Guitar | Ac. Guitar | --- | --- | --- | X |
| 005 - 000 | 018 | 12 Strings | Ac. Guitar | --- | --- | Delay | X |
| 005 - 000 | 019 | Jazz Chorus | El. Guitar | --- | X | Chorus | X |
| 005 - 000 | 020 | Vintage Jazz | El. Guitar | --- | X | --- | X |
| 005 - 000 | 021 | Soft Jazz | El. Guitar | --- | X | --- | X |
| 005 - 000 | 022 | Amp Jazz | El. Guitar | --- | X | Flanger | X |
| 005 - 000 | 023 | Jazz Wah | El. Guitar | --- | X | Wah-wah | X |
| 005 - 000 | 024 | Single Coil | El. Guitar | --- | X | Delay | X |
| 005 - 000 | 025 | Modern Clean | El. Guitar | --- | X | Chorus | X |
| 005 - 000 | 026 | Roto Clean | El. Guitar | --- | X | Rotary | X |
| 005 - 000 | 027 | Clean Funk Baby | El. Guitar | X | X | Wah-wah | X |
| 005 - 000 | 028 | Strato Rock | El. Guitar | X | X | Delay | X |
| 005 - 000 | 029 | Vintage EG | El. Guitar | --- | X | Tremolo | X |
| 005 - 000 | 030 | 80s Clean Dual Coil | El. Guitar | X | X | Chorus | X |
| 005 - 000 | 031 | Distant Flanger | El. Guitar | --- | --- | Flanger | X |
| 005 - 000 | 032 | 83 AMP 4C | El. Guitar | --- | X | Chorus | X |
| 005 – 000 | 033 | Amp 335 | El. Guitar | --- | X | Wah-wah | X |
| 005 – 000 | 034 | Lead Rocker | El. Guitar | X | X | Delay | X |
| 005 - 000 | 035 | Vintage Blue | El. Guitar | X | X | Vibrato | X |

# 6. PARAMETER LIST

## SOUND KEYBOARD, ENSEMBLE, BASS&GUITAR

| Sound Name | Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|---|---|---|---|---|
| DX Legend | Velocity Sens. | Filter CutOff | Dynamic Attack | Release Time |
| 80`s Memories | Velocity Sens. | Filter CutOff | Dynamic Attack | Release Time |
| DX II FX | Velocity Sens. | Filter CutOff | Bell Level | Release Time |
| DX II MJ | Velocity Sens. | Filter CutOff | Bell Level | Release Time |
| Gospel Organ | Percussion Level | Vel. Percussion | Vibrato Depth | Filter CutOff |
| Full Organ | Filter CutOff | Vibrato Rate | Vibrato Depth | Click Level |
| Mr Lord | Percussion Level | Vel. Percussion | Percussion Decay | Click Level |
| Mr Brian | Percussion Level | Vel. Percussion | Percussion Decay | Click Level |
| Hot Organ | Filter CutOff | Vibrato Rate | Vibrato Depth | Click Level |
| Hard Rock Organ | Percussion Level | Vel. Percussion | Percussion Decay | Click Level |
| Mr Jimmy | Percussion Level | Vel. Percussion | Percussion Decay | Click Level |
| Open the Doors | Filter CutOff | Vibrato Rate | Vibrato Depth | Click Level |
| Soft Organ | Percussion Level | Vel. Percussion | Vibrato Depth | Click Level |
| Mr Keith | Percussion Level | Vel. Percussion | Percussion Decay | Click Level |
| 70ies | Percussion Level | Vel. Percussion | Vibrato Depth | Click Level |
| Gimme some Rock | Percussion Level | Vel. Percussion | Vibrato Depth | Click Level |
| Lower Manual | Percussion Level | Vel. Percussion | Vibrato Depth | Click Level |
| Harpsichord | Velocity Sens. | Release Time | Stretching Tune | Release Noise |
| Double Harpsichord | Velocity Sens. | Release Time | Detune | Release Noise |
| Spinet | Velocity Sens. | Release Time | Stretching Tune | Release Noise |
| Virginal | Velocity Sens. | Release Time | Stretching Tune | Release Noise |
| Principal 8' | Attack Time | Filter CutOff | Vibrato Depth | Vibrato Rate |
| Principal Chorus | Attack Time | Balance | Filter CutOff | Detune |
| Plenum | Attack Time | Filter CutOff | Detune | Release Detune |
| Flutes and Nazard | Attack Time | Balance | Filter CutOff | Detune |
| Celeste | Attack Time | Detune | Filter CutOff | Filter Resonance |
| Echo Flues | Attack Time | Detune | Filter CutOff | Filter Resonance |
| Positive Organ | Attack Time | Balance | Filter CutOff | Detune |
| Accordion | Velocity Sens. | Filter CutOff | Sustain Level | Decay Time |
| Musette | Velocity Sens. | Filter CutOff | Sustain Level | Decay Time |
| Bandoneon | Velocity Sens. | Filter CutOff | Sustain Level | Decay Time |
| Harmonium | Velocity Sens. | Filter CutOff | Sustain Level | Decay Time |
| Chamber Trio | Velocity Sens. | Filter CutOff | Sustain Level | Release Time |
| Cellos | Velocity Sens. | Filter CutOff | Sustain Level | Release Time |
| Supreme Strings | Velocity Sens. | Velocity Filter | Sustain Level | Decay Time |
| Warm Strings | Velocity Sens. | Attack Time | Filter CutOff | Sustain Level |
| Octave Ensemble | Velocity Sens. | Filter CutOff | Sustain Level | Release Time |
| Strings Orchestra | Velocity Sens. | Velocity Filter | Sustain Level | Decay Time |
| Slow Ensemble | Velocity Sens. | Attack Time | Filter CutOff | Sustain Level |
| Marcato | Velocity Sens. | Decay Time | Sustain Level | Release Time |
| Tremolo Strings | Velocity Sens. | Velocity Filter | Sustain Level | Decay Time |
| Dark Octave | Velocity Sens. | Filter CutOff | Sustain Level | Release Time |
| HornsStrings | Velocity Sens. | Filter CutOff | Sustain Level | Release Time |
| Velo Horns | Velocity Sens. | Filter CutOff | Sustain Level | Release Time |
| Brass Band | Velocity Sens. | Attack Time | Release Time | Sustain Level |
| Big Band | Velocity Sens. | Attack Time | Release Time | Presence |
| Choir Ohs | Velocity Sens. | Filter CutOff | Attack Detuning | Release Time |
| Choir Ahs | Velocity Sens. | Filter CutOff | Attack Detuning | Release Time |
| Synth Strings1 | Attack Time | Decay Time | Release Time | Filter CutOff |
| Synth Strings2 | Attack Time | Decay Time | Release Time | Filter CutOff |
| Synth Strings3 | Attack Time | Decay Time | Release Time | Filter CutOff |
| Horns Pad | Attack Time | Release Time | Attack Detuning | Filter CutOff |
| Warm Pad | Velocity Sens. | Filter CutOff | Filter Resonance | Decay Time |
| Odyssey | Velocity Sens. | Filter CutOff | Filter Resonance | Decay Time |
| Galaxy Pad | Velocity Sens. | Filter CutOff | Filter Resonance | Decay Time |

| Sound Name | Parameter 1 | Parameter 2 | Parameter 3 | Parameter 4 |
|---|---|---|---|---|
| Ob Z-Pad | Velocity Sens. | Attack Time | Filter CutOff | Filter Sustain |
| Space Wind | Attack Time | Release Time | Sweep Depth | Sweep Rate |
| Quasar | Velocity Sens. | Filter CutOff | Filter Resonance | Decay Time |
| Sweeper | Attack Time | Release Time | Sweep Depth | Sweep Rate |
| Synth Brass | Attack Time | Release Time | Attack Detuning | Filter CutOff |
| Synth Horns | Sustain Level | Release Time | Filter CutOff | Filter Resonance |
| OB Horns | Sustain Level | Release Time | Filter CutOff | Filter Resonance |
| Jump | Attack Time | Release Time | Attack Detuning | Filter CutOff |
| Synth Qua | Sustain Level | Release Time | Filter CutOff | Filter Resonance |
| Upright | Velocity Sens. | HiVelocity Glide | Release Noise | Filter CutOff |
| Fat Jazz Bass | Velocity Sens. | HiVelocity Glide | Release Noise | Filter CutOff |
| Fretless | Velocity Sens. | HiVelocity Glide | Release Noise | Filter CutOff |
| Dynamic Fretless | Velocity Sens. | HiVelocity Glide | Release Noise | Filter CutOff |
| Chorus Bass | Velocity Sens. | HiVelocity Glide | Release Noise | Filter CutOff |
| Fingered Bass | Velocity Sens. | HiVelocity Glide | Release Noise | Filter CutOff |
| Mid Amp Finger | Velocity Sens. | HiVelocity Glide | Release Noise | Filter CutOff |
| Active Prec Bass | Velocity Sens. | HiVelocity Glide | Release Noise | Filter CutOff |
| Pick Mute Bass | Velocity Sens. | HiVelocity Glide | Release Noise | Filter CutOff |
| Pick Hot Tube | Velocity Sens. | HiVelocity Glide | Release Noise | Filter CutOff |
| Soft Slap | Velocity Sens. | HiVelocity Glide | Release Noise | Filter CutOff |
| Slap It! | Velocity Sens. | HiVelocity Glide | Release Noise | Filter CutOff |
| Synth Bass 1 | Filter Attack | Decay Time | Filter CutOff | Filter Resonance |
| Synth Bass 2 | Filter Attack | Filter Decay | Filter CutOff | Filter Resonance |
| Synth Bass 3 | Filter Attack | Filter Decay | Filter CutOff | Filter Resonance |
| Nylon Guitar | Velocity Sens. | Release Time | Release Noise | HiVelocity Glide |
| Steel Guitar | Velocity Sens. | Filter CutOff | Release Noise | HiVelocity Glide |
| 12 Strings | Velocity Sens. | Filter CutOff | Release Noise | Detune |
| Jazz Chorus | Velocity Sens. | Filter CutOff | Release Noise | HiVelocity Glide |
| Vintage Jazz | Velocity Sens. | Filter CutOff | Release Noise | HiVelocity Glide |
| Soft Jazz | Velocity Sens. | Filter CutOff | Release Noise | HiVelocity Glide |
| Amp Jazz | Velocity Sens. | Filter CutOff | Release Noise | HiVelocity Glide |
| Jazz Wah | Velocity Sens. | Filter CutOff | Release Noise | HiVelocity Glide |
| Single Coil | Velocity Sens. | Filter CutOff | Release Noise | Stretching Tune |
| Modern Clean | Velocity Sens. | Filter CutOff | Release Noise | Stretching Tune |
| Roto Clean | Velocity Sens. | Filter CutOff | Release Noise | Stretching Tune |
| Clean Funk Baby | Velocity Sens. | Filter CutOff | Release Noise | Stretching Tune |
| Strato Rock | Velocity Sens. | Filter CutOff | Release Noise | Stretching Tune |
| Vintage EG | Velocity Sens. | Filter CutOff | Release Noise | Stretching Tune |
| 80s Clean Dual Coil | Velocity Sens. | Filter CutOff | Release Noise | Stretching Tune |
| Distant Flanger | Velocity Sens. | Filter CutOff | Release Noise | Stretching Tune |
| 83 AMP 4C | Velocity Sens. | Filter CutOff | Release Noise | Stretching Tune |
| Amp 335 | Velocity Sens. | Filter CutOff | Release Noise | HiVelocity Glide |
| Lead Rocker | Velocity Sens. | Filter CutOff | Release Noise | Stretching Tune |
| Vintage Blue | Velocity Sens. | Filter CutOff | Release Noise | HiVelocity Glide |
| 83 AMP 4C | Velocity Sens. | Filter CutOff | Release Noise | Stretching Tune |

# 7. MIDI IMPLEMENTATION

All MIDI messages recognized by *Physis EX* are described below.
Channel messages are recognized on MIDI channels 1 or 2. System Exclusive messages are always recognized.

## CHANNEL MESSAGES

### Note On
Generated when a key is pressed.

```
Data format:           9nH kkH vvH

n=channel number:      00H - 0FH (1 - 16)
kk=note number:        00H - 7FH (0 - 127)
vv=note on velocity:   01H - 7FH (1 - 127)
                       00H (0) Note Off
```

### Note Off
Generated when a key is released.

```
Data format:           8nH kkH vvH
                       9nH kkH 00H

n=channel number:      00H - 0FH (1 - 16)
kk=note number:        00H - 7FH (0 - 127)
vv=note off velocity:  00H - 7FH (0 - 127)
```

- This message can be also detected as Note On with velocity=0.

### Control Change
These messages control sustain, volumes, expression and internal parameters.

#### Bank Select MSB (CC 0)
Controller transmitted in combination with Program Change, when a Memory or Sound has been selected.

```
Data format:           BnH 00H vvH

n=channel number:      00H - 0FH (1 - 16)
vv=bank MSB number:
               00H (0) Piano Sound family
               01H (1) E.Piano Sound family
               02H (2) Mallet Sound family
               03H (3) Keyboard Sound family
               04H (4) Ensemble Sound family
               05H (5) Bass/Guit Sound family
```

#### Modulation (CC 1)
Controls the Modulation effect for the Keyboard, Ensemble, Bass&Guitar Sounds.

```
Data format:           BnH 01H vvH

n=channel number:      00H - 0FH (1 - 16)
vv=value:              00H - 7FH (0 - 127)
```

#### Data Entry MSB (CC 6)
Sets the value for the parameter specified by NRPN LSB/MSB messages.

```
Data format:           BnH 06H vvH

n=channel number:      00H - 0FH (1 - 16)
vv=value:              00H - 7FH (0 - 127)
```

- The parameter is determined by both NRPN MSB and LSB data. Data Entry MSB values are applied to the parameter specified by the last recognized NRPN MSB/LSB.

#### Volume (CC 7)
Message which controls the Sound Volume (Volume parameter in MIXER function).

```
Data format:           BnH 07H vvH

n=channel number:      00H - 0FH (1 - 16)
vv=volume value:       00H - 7FH (0 - 127)
```

#### Pan (CC 10)
Controls the Pan parameter in MIXER function.

```
Data format:           BnH 0AH vvH

n=channel number:      00H - 0FH (1 - 16)
vv=volume value:       00H - 7FH (0 - 127)
```

- Value 0 corresponds to completely Left, 64 to center, 127 to completely Right.

#### Expression (CC 11)
Controls the Sound Expression.

```
Data format:           BnH 0BH vvH

n=channel number:      00H - 0FH (1 - 16)
vv=expression value:   00H - 7FH (0 - 127)
```

#### Sustain (CC 64)
Controls the Sustain / Damper effect.

```
Data format:           BnH 40H vvH

n=channel number:      00H - 0FH (1 - 16)
vv=switch:             00H - 7FH (0 - 127)
```

#### Sostenuto (CC 66)
Controls the Sostenuto effect.

```
Data format:           BnH 42H vvH

vv=switch:             00H - 3FH (0 - 63) off
40H - 7FH (64 - 127) on
```

- This effect is only available for Piano Sounds.

#### Soft (CC 67)
Controls the Soft effect.

```
Data format:           BnH 43H vvH

vv=switch:             00H - 3FH (0 - 63) off
                       40H - 7FH (64 - 127) on
```

- This effect is only available for Piano Sounds.

#### Reverb Send (CC 91)
Controls the Rev Send parameter of the MIXER function.

```
Data format:           BnH 5BH vvH

n=channel number:      00H - 0FH (1 - 16)
vv=volume value:       00H - 7FH (0 - 127)
```

### Efx Send (CC 93)
Controls the Efx Send parameter of the MIXER function.

```
Data format:          BnH 5DH vvH

n=channel number:     00H – 0FH (1 – 16)
vv=value:             00H – 7FH (0 – 127)
```

### NRPN (Non-Registered Parameter Number) LSB (CC 98)
This message specifies the parameter regulated by the Data Entry MSB message.

```
Data format:          BnH 62H vvH

n=channel number:     00H – 0FH (1 – 16)
vv=parameter number:  00H – 7FH (0 – 127)
```

- The parameter is determined by both NRPN MSB and LSB data.
- The NRPN Table shows the combination of NRPN MSB and LSB of each parameter.

### NRPN (Non-Registered Parameter Number) MSB (CC 99)
This message specifies the parameter section determined by NRPN LSB message.

```
Data format:          BnH 63H vvH

n=channel number:     00H – 0FH (1 – 16)
vv=value:             00H – 7FH (0 – 127)
```

- The Parameter is determined by both NRPN MSB and LSB data.
- See NRPN Table to know the combination of NRPN MSB and LSB of each parameter.

### All sounds off (CC 120)
Mutes sounds on a specific channel, other channels are unaffected.

```
Data format:          BnH 78H vvH

n=channel number :    00H – 0FH (1 – 16)
vv=switch:            00H – 7FH (0 – 127)
```

### Reset All Controllers (CC 121)
Following controllers are set to the following value:
Expression: 127
Sustain: Off
Sostenuto: Off
Soft: Off
Pitch Bend: 64

```
Data format:          BnH 79H 00H

n=channel number:     00H – 0FH (1 – 16)
vv=switch:            00H – 7FH (0 – 127)
```

### All notes off (CC 123)
Stops all notes currently playing on a specific channel; other channels are unaffected. If Sustain or Sostenuto are on, notes will continue to sound until these are switched off.

```
Data format:          BnH 7BH 00H

n=channel number:     00H – 0FH (1 – 16)
vv=switch:            00H – 7FH (0 – 127)
```

## Program Change
Selects Sounds or Memories, in combination with Control Change 0 (Bank Select MSB).

```
Data format:                  CnH mmH

n=channel number:             00H – 0FH (1 – 16)
mm=Program Change number:     00H – 7FH (0–127)
```

- Make sure that the Program Change number is 1 unit less than the Sound number. So, location 1 is recalled by PC 0, location 2 by PC 1, etc.

## Aftertouch
Controls the Channel Pressure effect for the Keyboard, Ensemble, Bass&Guitar Sounds.

```
Data format:                  DnH vvH

n=channel number:             00H – 0FH (1 – 16)
vv=value:                     00H – 7FH (0–127)
```

## Pitch Bend
Controls the Pitch Bend effect for the Keyboard, Ensemble, Bass&Guitar Sounds.

```
Data format:                  EnH vvH

n=channel number:             00H – 0FH (1 – 16)
vv=value:                     00H – 7FH (0–127)
```

# SYSTEM MESSAGES

## System Exclusive

### Master Fine Tuning
This message controls the Fine Tuning parameter of the TUNING function under the FUNCTION menu.

```
Data format: F0H 7FH 7FH 04H 03H vvH nnH F7H

F0H: Exclusive status
7FH: Universal Realtime message
7FH: channel (any)
04H: Sub-ID #1=Device Control message
03H: Sub-ID #2=Master Fine tuning
vvH nnH: fine tuning value
         00H 00H: A4=415,3 Hz
         00H 40H: A4=440 Hz
         7FH 7FH: A4=466,2 Hz
F7H: End of Exclusive
```

### Temperament
Selects the Temperament as in the Tuning function of FUNCTION menu.

```
Data format: F0H 7EH 7FH 08H 08H 03H 7FH 7FH [ss]
... F7

F0H: Exclusive status
7EH: Universal Non Realtime message
7FH: channel (any)
08H: Sub-ID #1=MIDI Tuning standard
08H: Sub-ID #2=scale/octave tuning 1-byte form
               (Non Real-Time)
03H: channel/options byte 1
7FH: channel byte 2
7FH: channel byte 3
[ss]:12 byte tuning offset of 12 semitones from C
     to B
     00H: -64 cents
     40H: 0 cents
     7FH: +64 cents
F7H: End of Exclusive
```

## NRPN TABLES

### φ PIANO / SOUND EDIT / SOUND ENGINE
NRPN MSB = 00H (00)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 00H (0) | 0EH (14)...40H (64)...72H (114) | Hammer / Hardness | -50...0...+50 |
| 01H (1) | 0EH (14)...40H (64)...72H (114) | Hammer / Mass | -50...0...+50 |
| 02H (2) | 0EH (14)...40H (64)...72H (114) | Hammer / Knock | -50...0...+50 |
| 03H (3) | 0EH (14)...40H (64)...72H (114) | Hammer / Hit Point | -50...0...+50 |
| 04H (4) | 0EH (14)...40H (64)...72H (114) | Tuning / Unison | -50...0...+50 |
| 05H (5) | 0EH (14)...40H (64)...72H (114) | Tuning / Stretch | -50...0...+50 |
| 06H (6) | 0EH (14)...40H (64)...72H (114) | String Type / Str. Stiffness | -50...0...+50 |
| 07H (7) | 0EH (14)...40H (64)...72H (114) | String Type / Duplex Vibr. | -50...0...+50 |
| 08H (8) | 0EH (14)...40H (64)...72H (114) | String Type / Longit. Vibr. | -50...0...+50 |
| 09H (9) | 0EH (14)...40H (64)...72H (114) | Resonance / String | -50...0...+50 |
| 0AH (10) | 0EH (14)...40H (64)...72H (114) | Resonance / Damper Noise | -50...0...+50 |
| 0BH (11) | 0EH (14)...40H (64)...72H (114) | Resonance / Damper | -50...0...+50 |
| 0CH (12) | 0EH (14)...40H (64)...72H (114) | Resonance / Damper Size | -50...0...+50 |
| 0DH (13) | 0EH (14)...40H (64)...72H (114) | Size / String Lenght | -50...0...+50 |
| 0EH (14) | 0EH (14)...40H (64)...72H (114) | Size / Absorption | -50...0...+50 |
| 0FH (15) | 0EH (14)...40H (64)...72H (114) | Size / Soundboard | -50...0...+50 |

### φ E.PIANO (CLAVI) / SOUND EDIT / SOUND ENGINE
NRPN MSB = 00H (00)

| LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 00H (0) | 0EH (14)...40H (64)...72H (114) | Tangent | -50...0...+50 |
| 01H (1) | 0EH (14)...40H (64)...72H (114) | Damping Yarn | -50...0...+50 |
| 02H (2) | 0EH (14)...40H (64)...72H (114) | Pickup Position | -50...0...+50 |
| 03H (3) | 00H (0) ... 32H (50) | Age | 0 ... 50 |
| 04H (4) | *See table 1* | Panel | On, Off |
| 05H (5) | *See table 2* | Panel | On, Off |
| 06H (6) | 00H (0) ... 32H (50) | Mute Level | 0 ... 50 |

Table 1

| BRILLIANT | TREBLE | MEDIUM | SOFT | Data Entry MSB Range |
|---|---|---|---|---|
| OFF | OFF | OFF | OFF | 00H (0) |
| ON | OFF | OFF | OFF | 01H (1) |
| OFF | ON | OFF | OFF | 02H (2) |
| ON | ON | OFF | OFF | 03H (3) |
| OFF | OFF | ON | OFF | 04H (4) |
| ON | OFF | ON | OFF | 05H (5) |
| OFF | ON | ON | OFF | 06H (6) |
| ON | ON | ON | OFF | 07H (7) |
| OFF | OFF | OFF | ON | 08H (8) |
| ON | OFF | OFF | ON | 09H (9) |
| OFF | ON | OFF | ON | 0AH (10) |
| ON | ON | OFF | ON | 0BH (11) |
| OFF | OFF | ON | ON | 0CH (12) |
| ON | OFF | ON | ON | 0DH (13) |
| OFF | ON | ON | ON | 0EH (14) |
| ON | ON | ON | ON | 0FH (15) |

Table 2

| C-D | A-B | Data Entry MSB Range |
|---|---|---|
| C | A | 00H (0) |
| D | A | 01H (1) |
| C | B | 02H (2) |
| D | B | 03H (3) |

### φ E.PIANO (RHODY) / SOUND EDIT / SOUND ENGINE
NRPN MSB = 00H (00)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 00H (0) | 0EH (14)...40H (64)...72H (114) | Hammer | -50...0...+50 |
| 01H (1) | 0EH (14)...40H (64)...72H (114) | Damper Felt | -50...0...+50 |
| 02H (2) | 0EH (14)...40H (64)...72H (114) | Tone Bar Size | -50...0...+50 |
| 03H (3) | 0EH (14)...40H (64)...72H (114) | Tone Bar Body | -50...0...+50 |
| 04H (4) | 0EH (14)...40H (64)...72H (114) | Tine Position | -50...0...+50 |

### φ E.PIANO (WURLY) / SOUND EDIT / SOUND ENGINE
NRPN MSB = 00H (00)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 00H (0) | 0EH (14)...40H (64)...72H (114) | Hammer | -50...0...+50 |
| 01H (1) | 0EH (14)...40H (64)...72H (114) | Damper Felt | -50...0...+50 |
| 02H (2) | 0EH (14)...40H (64)...72H (114) | Reed Size | -50...0...+50 |
| 03H (3) | 0EH (14)...40H (64)...72H (114) | Reed Position | -50...0...+50 |

### φ E.PIANO (PIANY) / SOUND EDIT / SOUND ENGINE
NRPN MSB = 00H (00)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 00H (0) | 0EH (14)...40H (64)...72H (114) | Hammer | -50...0...+50 |
| 01H (1) | 0EH (14)...40H (64)...72H (114) | Damper Felt | -50...0...+50 |
| 02H (2) | 0EH (14)...40H (64)...72H (114) | Reed Size | -50...0...+50 |
| 03H (3) | 0EH (14)...40H (64)...72H (114) | Reed Position | -50...0...+50 |
| 04H (4) | 0EH (14)...40H (64)...72H (114) | Reed Body | -50...0...+50 |

### φ MALLET / SOUND EDIT / SOUND ENGINE
NRPN MSB = 00H (00)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 00H (0) | 0EH (14)...40H (64)...72H (114) | Bar Material | -50...0...+50 |
| 01H (1) | 0EH (14)...40H (64)...72H (114) | Mallet Material | -50...0...+50 |
| 02H (2) | 0EH (14)...40H (64)...72H (114) | Hit Position | -50...0...+50 |
| 03H (3) | 0EH (14)...40H (64)...72H (114) | Hit Range | -50...0...+50 |
| 04H (4) | 0EH (14)...40H (64)...72H (114) | Rotor Angle | -50...0...+50 |
| 05H (5) | 0EH (14)...40H (64)...72H (114) | Rotor Speed | -50...0...+50 |
| 06H (6) | 00H (0)...3F (63), 40H (64)...7FH (127) | Motor On/Off | Off, On |

### KEYBOARD, ENSEMBLE, BASS/GUIT / SOUND EDIT / SOUND ENGINE
NRPN MSB = 00H (00)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 00H (0) | 00H (0) ... 7FH (127) | Parameter 1 | 0 ... 127 |
| 01H (1) | 00H (0) ... 7FH (127) | Parameter 2 | 0 ... 127 |
| 02H (2) | 00H (0) ... 7FH (127) | Parameter 3 | 0 ... 127 |
| 03H (3) | 00H (0) ... 7FH (127) | Parameter 4 | 0 ... 127 |

- See chapt. 6 to know Paramters name of each Sound.

### SOUND EDIT / COMPR
NRPN MSB = 01H (01)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 00H (0) | 00H (0)...3F (63), 40H (64)...7FH (127) | Compr On/Off | Off, On |
| 01H (1) | 00H (0) ... 7FH (127) | Thres. | -36.00 ... 0.00 |
| 02H (2) | 00H (0) ... 09H (9) | Ratio | 1.2:1 ... 10.0:1 |
| 03H (3) | 00H (0) ... 7FH (127) | Attack | 0.50 ... 200.00 |
| 04H (4) | 00H (0) ... 7FH (127) | Rel. | 50.00 ... 500.00 |

### SOUND EDIT / AMP
NRPN MSB = 02H (02)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 00H (0) | 00H (0)...3F (63), 40H (64)...7FH (127) | Amp On/Off | Off, On |
| 01H (1) | 00H (0) ... 09H (9)<br>0AH (10) ... 0EH (14)<br>0FH (15) ... 12H (18) | Pre Amp Type | Tube1... Tube10<br>Trans.1...Trans.5<br>HTube1...HTube4 |
| 02H (2) | 00H (0) ... 7FH (127) | Pre Amp Drive | 0 ... 127 |
| 03H (3) | 00H (0) ... 04H (4) | PreAmp HiDamp | 1k6 ... 4k0 |
| 04H (4) | 00H (0)<br>01H (1)<br>02H (2)<br>03H (3)<br>04H (4)<br>05H (5) | Power Amp Type | Sweet<br>Vintage<br>Punch<br>Loud<br>Hot<br>Overbass |
| 05H (5) | 00H (0) ... 7FH (127) | Power Amp Char. | 0 ... 127 |
| 06H (6) | 00H (0)<br>01H (1), 02H (2), 03H (3) | Cabinet Type | DI-box<br>1, 2, 4 cones |
| 07H (7) | 00H (0) ... 7FH (127) | Cabinet Color | 0 ... 127 |
| 08H (8) | 00H (0) ... 7FH (127) | Level | 0 ... 127 |

### SOUND EDIT / EFX
NRPN MSB = 03H (03)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 00H (0) | 00H (0)...3F (63), 40H (64)...7FH (127) | Efx On/Off | Off, On |

### SOUND EDIT / EFX / DELAY
NRPN MSB = 03H (03)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 01H (1) | 00H (0) ... 02H (2) | Type | Mono, Stereo, PingPong |
| 03H (3) | 00H (0) ... 7FH (127) | Delay | 1.0 ... 1500.0 |
| 04H (4) | 00H (0) ... 7FH (127) | Feedback | 0 ... 127 |
| 05H (5) | 00H (0) ... 7FH (127) | Hi Damp | 0 ... 127 |
| 0BH (11) | 00H (0) ... 7FH (127) | Dry/Wet | 0 ... 127 |

## SOUND EDIT / EFX / CHORUS

NRPN MSB = 03H (03)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 01H (1) | 03H (3) ... 06H (6) | Type | Chorus 1 ... 4 |
| 03H (3) | 00H (0) ... 7FH (127) | Depth | 0 ... 127 |
| 04H (4) | 00H (0) ... 7FH (127) | Speed | 0.00 ... 12.00 |
| 05H (5) | 00H (0) ... 7FH (127) | Delay | 0.10 ... 20.00 |
| 0BH (11) | 00H (0) ... 7FH (127) | Dry/Wet | 0 ... 127 |

## SOUND EDIT / EFX / FLANGER

NRPN MSB = 03H (03)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 01H (1) | 07H (7), 08H (8) | Type | Flanger 1, 2 |
| 03H (3) | 00H (0) ... 7FH (127) | Depth | 0 ... 127 |
| 04H (4) | 00H (0) ... 7FH (127) | Speed | 0.00 ... 12.00 |
| 05H (5) | 00H (0) ... 7FH (127) | Delay | 0.10 ... 20.00 |
| 06H (6) | 00H (0)...40H (64)...7FH (127) | Feedback | -63...0...+64 |
| 07H (7) | 00H (0) ... 7FH (127) | Hi Damp | 0 ... 127 |
| 0BH (11) | 00H (0) ... 7FH (127) | Dry/Wet | 0 ... 127 |

## SOUND EDIT / EFX / VIBRATO

NRPN MSB = 03H (03)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 01H (1) | 09H (9), 0AH (10) | Type | Vibrato 1, 2 |
| 03H (3) | 00H (0) ... 7FH (127) | Depth | 0 ... 127 |
| 04H (4) | 00H (0) ... 7FH (127) | Speed | 0.00 ... 12.00 |
| 05H (5) | 00H (0) ... 7FH (127) | Delay | 0.10 ... 20.00 |
| 0BH (11) | 00H (0) ... 7FH (127) | Dry/Wet | 0 ... 127 |

## SOUND EDIT / EFX / TREMOLO

NRPN MSB = 03H (03)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 01H (1) | 0BH (11), 0CH (12) | Type | Classic. Panning |
| 03H (3) | 00H (0) ... 7FH (127) | Depth | 0 ... 127 |
| 04H (4) | 00H (0) ... 7FH (127) | Speed | 0.00 ... 12.00 |
| 05H (5) | 00H (0) ... 7FH (127) | Shape | 0 ... 127 |

## SOUND EDIT / EFX / PHASER

NRPN MSB = 03H (03)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 01H (1) | 0DH (13) ... 10H (16) | Type | 4, 6, 8, 12 Stage |
| 03H (3) | 00H (0) ... 7FH (127) | Depth | 0 ... 127 |
| 04H (4) | 00H (0) ... 7FH (127) | Speed | 0.00 ... 12.00 |
| 05H (5) | 00H (0) ... 7FH (127) | Feedback | 0 ... 127 |
| 06H (6) | 00H (0) ... 7FH (127) | Manual | 0 ... 127 |
| 07H (7) | 00H (0) ... 7FH (127) | Phase | 0 ... 127 |
| 0BH (11) | 00H (0) ... 7FH (127) | Dry/Wet | 0 ... 127 |

## SOUND EDIT / EFX / PHA+TREM

NRPN MSB = 03H (03)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 01H (1) | 11H (17) | Type | Phaser+Tremolo |
| 03H (3) | 00H (0) ... 7FH (127) | Ph. Depth | 0 ... 127 |
| 04H (4) | 00H (0) ... 7FH (127) | Ph. Speed | 0.00 ... 12.00 |
| 05H (5) | 00H (0) ... 7FH (127) | Ph. Feedback | 0 ... 127 |
| 06H (6) | 00H (0) ... 7FH (127) | Ph. Manual | 0 ... 127 |
| 07H (7) | 00H (0) ... 7FH (127) | Tr. Depth | 0 ... 127 |
| 08H (8) | 00H (0) ... 7FH (127) | Tr. Speed | 0 ... 127 |
| 09H (9) | 00H (0)...3F (63),<br>40H (64)...7FH (127) | Tr. Phase | 0, 180 |
| 0AH (10) | 00H (0) ... 7FH (127) | Tr. Shape | 0 ... 127 |

## SOUND EDIT / EFX / WAH WAH

NRPN MSB = 03H (03)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 01H (1) | 12H (18) ... 14H (20) | Type | Pedal, Auto, Touch |
| 03H (3) | 00H (0) ... 7FH (127) | Top | 0 ... 127 |
| 04H (4) | 00H (0) ... 7FH (127) | Bottom | 0 ... 127 |
| 05H (5) | 00H (0) ... 7FH (127) | Resonance | 0 ... 127 |
| 06H (6) | 00H (0), 01H (1), 02H (2) | Filter Type | LP, BP, HP |
| 07H (7) | 00H (0) ... 7FH (127) | Speed (Type=Auto) | 0.00 ... 12.00 |
| 08H (8) | 00H (0) ... 7FH (127) | Sensitivity (Type=Touch) | 0 ... 127 |
| 09H (9) | 00H (0) ... 7FH (127) | Foot Control (Type=pedal) | 0 ... 127 |
| 0BH (11) | 00H (0) ... 7FH (127) | Dry/Wet | 0 ... 127 |

## SOUND EDIT / EFX / ROTARY

NRPN MSB = 03H (03)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 01H (1) | 15H (21), 16H (22) | Type | 2, 1 Rotor |
| 03H (3) | 00H (0) ... 7FH (127) | Slow Speed | 0 ... 127 |
| 04H (4) | 00H (0) ... 7FH (127) | Fast Speed | 0 ... 127 |
| 05H (5) | 00H (0) ... 7FH (127) | Balance | 0 ... 127 |
| 06H (6) | 00H (0)...3F (63), 40H (64)...7FH (127) | Speed | Slow, Fast |
| 07H (7) | 00H (0) ... 7FH (127) | Rise/Fall | 0 ... 127 |
| 08H (8) | 00H (0)...3F (63), 40H (64)...7FH (127) | Brake | Off, On |
| 0BH (11) | 00H (0) ... 7FH (127) | Dry/Wet | 0 ... 127 |

## SOUND EDIT / EQ

NRPN MSB = 04H (04)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 00H (0) | 00H (0)...3F (63), 40H (64)...7FH (127) | Eq On/Off | Off, On |
| 02H (2) | 34H (52)...40H (64)...4CH (76) | Low S. | -12 ... 0 ... +12 |
| 03H (3) | 00H (0) ... 7FH (127) | Freq. | 300 ... 4800 |
| 04H (4) | 00H (0) ... 7FH (127) | BW | 0.50 ... 3.00 |
| 05H (5) | 34H (52)...40H (64)...4CH (76) | Gain | -12 ... 0 ... +12 |
| 06H (6) | 34H (52)...40H (64)...4CH (76) | Hi S. | -12 ... 0 ... +12 |

## φ PIANO / SOUND EDIT / SOUND ENGINE / FINE TUNING

NRPN MSB = 05H (05)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| *See table below* | 0EH (14)...40H (64)...72H (114) | Size / Cent. | -50...0...+50 |

| NRPN LSB | Key | NRPN LSB | Key | NRPN LSB | Key | NRPN LSB | Key |
|---|---|---|---|---|---|---|---|
| 15 (21) | A0 | 2B (43) | G2 | 41 (65) | F4 | 57 (87) | D#6 |
| 16 (22) | A#0 | 2C (44) | G#2 | 42 (66) | F#4 | 58 (88) | E6 |
| 17 (23) | B0 | 2D (45) | A2 | 43 (67) | G4 | 59 (88) | F6 |
| 18 (24) | C1 | 2E (46) | A#2 | 44 (68) | G#4 | 5A (90) | F#6 |
| 19 (25) | C#1 | 2F (47) | B2 | 45 (69) | A4 | 5B (91) | G6 |
| 1A (26) | D1 | 30 (48) | C3 | 46 (70) | A#4 | 5C (92) | G#6 |
| 1B (27) | D#1 | 31 (49) | C#3 | 47 (71) | B4 | 5D (93) | A6 |
| 1C (28) | E1 | 32 (50) | D3 | 48 (72) | C5 | 5E (94) | A#6 |
| 1D (29) | F1 | 33 (51) | D#3 | 49 (73) | C#5 | 5F (95) | B6 |
| 1E (30) | F#1 | 34 (52) | E3 | 4A (74) | D5 | 60 (96) | C7 |
| 1F (31) | G1 | 35 (53) | F3 | 4B (75) | D#5 | 61 (97) | C#7 |
| 20 (32) | G#1 | 36 (54) | F#3 | 4C (76) | E5 | 62 (98) | D7 |
| 21 (33) | A1 | 37 (55) | G3 | 4D (77) | F5 | 63 (99) | D#7 |
| 22 (34) | A#1 | 38 (56) | G#3 | 4E (78) | F#5 | 64 (100) | E7 |
| 23 (35) | B1 | 39 (57) | A3 | 4F (79) | G5 | 65 (101) | F7 |
| 24 (36) | C2 | 3A (58) | A#3 | 50 (80) | G#5 | 66 (102) | F#7 |
| 25 (37) | C#2 | 3B (59) | B3 | 51 (81) | A5 | 67 (103) | G7 |
| 26 (38) | D2 | 3C (60) | C4 | 52 (82) | A#5 | 68 (104) | G#7 |
| 27 (39) | D#2 | 3D (61) | C#4 | 53 (83) | B5 | 69 (105) | A7 |
| 28 (40) | E2 | 3E (62) | D4 | 54 (84) | C6 | 6A (106) | A#7 |
| 29 (41) | F2 | 3F (63) | D#4 | 55 (85) | C#6 | 6B (107) | B7 |
| 2A (42) | F#2 | 40 (64) | E4 | 56 (86) | D6 | 6C (108) | C8 |

## EFFECT

NRPN MSB = 06H (06)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 00H (0) | 00H (0)...3F (63),<br>40H (64)...7FH (127) | Effect On/Off | Off, On |

## EFFECT / DELAY

NRPN MSB = 06H (06)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 01H (1) | 00H (0) ... 02H (2) | Type | Mono, Stereo, PingPong |
| 03H (3) | 00H (0) ... 7FH (127) | Delay | 1.0 ... 1500.0 |
| 04H (4) | 00H (0) ... 7FH (127) | Feedback | 0 ... 127 |
| 05H (5) | 00H (0) ... 7FH (127) | Hi Damp | 0 ... 127 |
| 06H (6) | 00H (0) ... 7FH (127) | Level | 0 ... 127 |

## EFFECT / CHORUS

NRPN MSB = 06H (06)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 01H (1) | 03H (3) ... 06H (6) | Type | Chorus 1 ... 4 |
| 03H (3) | 00H (0) ... 7FH (127) | Depth | 0 ... 127 |
| 04H (4) | 00H (0) ... 7FH (127) | Speed | 0.00 ... 12.00 |
| 05H (5) | 00H (0) ... 7FH (127) | Delay | 0.10 ... 20.00 |
| 06H (6) | 00H (0) ... 7FH (127) | Level | 0 ... 127 |

### REVERB
NRPN MSB = 07H (07)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 00H (0) | 00H (0)...3F (63),<br>40H (64)...7FH (127) | Reverb On/Off | Off, On |
| 01H (1) | 00H (0)<br>01H (1)<br>02H (2)<br>03H (3)<br>04H (4)<br>05H (5)<br>06H (6)<br>07H (7) | Type | Small Room<br>Large Roon<br>Small Hall<br>Medium Hall<br>Large Hall<br>Plate<br>Spring<br>Tape |
| 02H (2) | 00H (0) ... 7FH (127) | Time | 0 ... 127 |
| 03H (3) | 00H (0) ... 7FH (127) | Hi Damp | 0 ... 127 |
| 04H (4) | 04H (4)...40H (64)...7CH (124) | Low Gain | -6.0...0.0...6.0 |
| 05H (5) | 04H (4)...40H (64)...7CH (124) | High Gain | -6.0...0.0...6.0 |
| 06H (6) | 00H (0) ... 7FH (127) | Level | 0 ... 127 |

### EQ
NRPN MSB = 08H (08)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 00H (0) | 00H (0)...3F (63),<br>40H (64)...7FH (127) | Eq On/Off | Off, On |
| 01H (1) | 00H (0)<br>01H (1) | Type | Parametric<br>Graphic |

### EQ / PARAMETRIC
NRPN MSB = 08H (08)

| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 02H (2) | 34H (52)...40H (64)...4CH (76) | Low S. | -12 ... 0 ... +12 |
| 03H (3) | 00H (0) ... 7FH (127) | Freq. | 300 ... 4800 |
| 04H (4) | 00H (0) ... 7FH (127) | BW | 0.50 ... 3.00 |
| 05H (5) | 34H (52)...40H (64)...4CH (76) | Gain | -12 ... 0 ... +12 |
| 06H (6) | 34H (52)...40H (64)...4CH (76) | Hi S. | -12 ... 0 ... +12 |

### EQ / GRAPHIC
NRPN MSB = 08H (08)

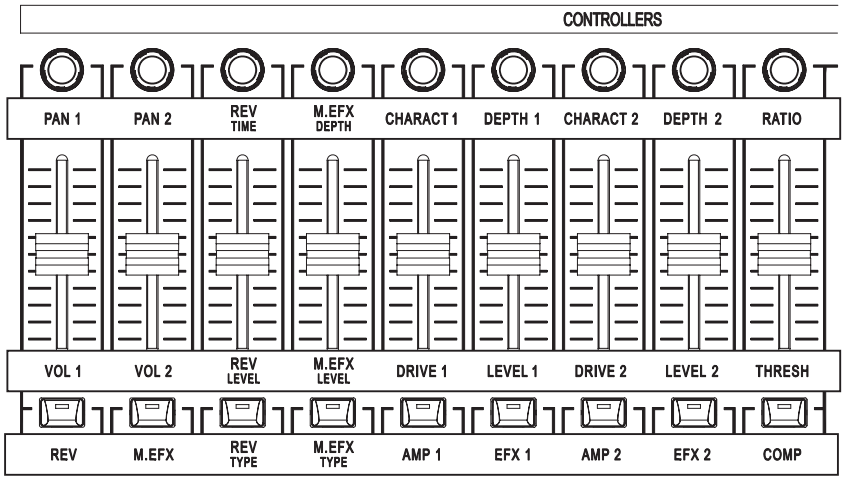
| NRPN LSB | Data Entry MSB Range | Parameter | Par. Range |
|---|---|---|---|
| 02H (2) | 34H (52)...40H (64)...4CH (76) | Low | -12 ... 0 ... +12 |
| 03H (3) | 34H (52)...40H (64)...4CH (76) | Low-Mid. | -12 ... 0 ... +12 |
| 04H (4) | 34H (52)...40H (64)...4CH (76) | Mid | -12 ... 0 ... +12 |
| 05H (5) | 34H (52)...40H (64)...4CH (76) | Hi-Mid | -12 ... 0 ... +12 |
| 06H (6) | 34H (52)...40H (64)...4CH (76) | Hi | -12 ... 0 ... +12 |

### NB:
- Data Entry of On/Off parameters is transmitted as OFF = 00H (0), ON = 7FH (127). Values from 00H (0) to 3FH (63) and from 40H (64) to 7FH (127) are, however, recognized respectively as OFF and ON selection.
- Should the parameters' range be less than 0...127 or -63...+64, smaller or larger Data Entry values are raised or lowered to the nearest value limit.

NRPNs MSB and LSB for SOUND ENGINE parameters are the same for all Sound types and families. Always check the Sound you are currently using, as the same message might have different effects according to the selected Sound.

# 8. USING THE MAGNETIC LABELS

Inside the package there are three magnetic blue labels, with functions printed on them. These labels explain the functions assigned to the K4 / K5 controls when standard Performances, as they are configured when the instrument has been purchased.
This is how the labels should be placed:




The labels allow the player to remember easily the function assigned to each control without checking the display.

The functions are:
REV: activate/deactivate the MASTER REVERB effect
VOL 1: volume for Zone 1 Sound
PAN 1: panning for Zone 1 Sound
M.EFX: activate/deactivate the MASTER EFFECT
VOL 2: volume for Zone 2 Sound
PAN 2: panning for Zone 2 Sound
REV TYPE: MASTER REVERB type
REV LEVEL: MASTER REVERB level
REV TIME: MASTER REVERB effect decay time
M.EFX TYPE: MASTER EFFECT type
M.EFX DEPTH: modulation depth (for Chorus) or time betwee repetitions (for Delay) of the MASTER EFFECT
M.EFX LEVEL: MASTER EFFECT level
AMP 1: activate/deactivate the AMPLIFIER effect applied to Zone 1 Sound
DRIVE 1: gain of the APLIFIER effect applied to Zone 1 Sound
CHARACT 1: character of the AMPLIFIER effect applied to Zone 1 Sound
EFX 1: activate/deactivate the EFX effect applied to Zone 1 Sound
LEVEL 1: sound level of the EFX effect applied to Zone 1 Sound
DEPTH 1: modulation depth (Chorus), time between repetitions (Delay) or Fast speed (Rotary) of the EFX effect applied to Zone 1 sound
AMP 2: activate/deactivate the AMPLIFIER effect applied to Zone 2 Sound
DRIVE 2: gain of the APLIFIER effect applied to Zone 2 Sound
CHARACT 2: character of the AMPLIFIER effect applied to Zone 2 Sound
EFX 2: activate/deactivate the EFX effect applied to Zone 2 Sound
LEVEL 2: sound level of the EFX effect applied to Zone 2 Sound
DEPTH 2: modulation depth (Chorus), time between repetitions (Delay) or Fast speed (Rotary) of the EFX effect applied to Zone 2 sound
COMP: activate/deactivate the COMPRESSOR effect
THRESH: threshold of the COMPRESSOR effect
RATIO: compression ratio of the COMPRESSOR effect

Keep in mind that the functions described in these labels only reflect the factory settings. Programming or modifying Performances might cause a discrepancy between the printed loabels and the actual functions.

# MIDI IMPLEMENTATION CHART

**Physis Piano Physis EX**
Sound Board Expansion

Version: 1.0
Date: 30/01/2014

| FUNCTION… | | | TRANSMITTED | RECEIVED | REMARKS |
|---|---|---|---|---|---|
| **BASIC** | Default | | X | 1 - 2 | |
| **CHANNEL** | Changed | | X | 1 - 2 | |
| **MODE** | Default | | X | Mode 3 | |
| | Messages | | ******** | ******** | |
| | Altered | | ******** | ******** | |
| **NOTE** | | | X | 0÷127 | |
| **NUMBER** | True Voice | | X | 0÷127 | K4 model |
| **VELOCITY** | Note ON | | X | O | |
| | Note OFF | | X | O | |
| **AFTER** | Key's | | X | X | |
| **TOUCH** | Ch's | | X | O | |
| **PITCH BEND** | | | X | O | |
| **CONTROL** | | 0 | X | O | Bank Select MSB |
| **CHANGE** | | 1 | | | Modulation |
| | | 6 | | | Data Entry MSB |
| | | 7 | | | Volume |
| | | 10 | | | Pan |
| | | 11 | | | Expression |
| | | 64 | | | Sustain |
| | | 66 | | | Sostenuto |
| | | 67 | | | Soft |
| | | 91 | | | Reverb Send |
| | | 93 | | | Efx Send |
| | | 98 | | | NRPN LSB |
| | | 99 | | | NRPN MSB |
| | | 120 | | | All Sounds Off |
| | | 121 | | | Reset All Controllers |
| | | 123 | | | All Notes Off |
| **PROGRAM** | | | X | O | *1 |
| **CHANGE** | True# | | ******** | O | |
| **SYSTEM EXCLUSIVE** | | | X | O | |
| **SYSTEM** | Song Pos | | X | X | |
| **COMMON** | Song Sel | | X | X | |
| | Tune | | X | X | |
| **SYSTEM** | Clock | | X | X | |
| **REAL TIME** | Commands | | X | X | |
| **AUX** | Local On-Off | | X | X | |
| **MESSAGES** | All notes off | | X | O | |
| | Active Sense | | X | O | |
| | Reset | | X | X | |
| **NOTES:** | *1: see chapt. 5 | | | | |

Mode 1: Omni On, Poly
Mode 2: Omni On, Mono
Mode 3: Omni Off, Poly
Mode 4: Omni Off, Mono

O=YES
X=NO

PHYSIS PIANO

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